The Iron Age

A Review of the Hardware, Iron and Metal Trades.

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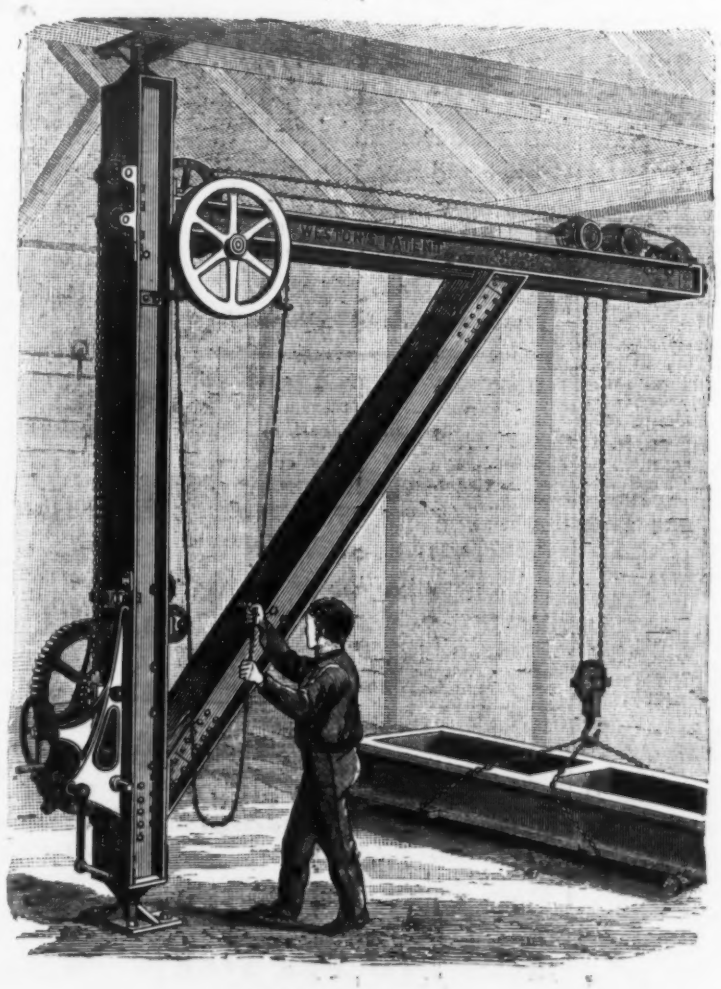
An Improved Jib Crane.

We illustrate herewith a new form of foundry or jib crane, made by the Yale Lock Manufacturing Company, of Stamford, Conn., embodying the latest improvements of Mr. T. A. Weston. The machine is a swinging jib crane suitable for foundries, machine shops and kindred uses. Its frame is built wholly of wrought iron. The hoisting mechanism is attached to the king-post, and is provided with three changes of speed, in all of which is utilized the Weston safety brake, by the use of which the flying back of the handles is prevented, and the danger from this most fruitful cause of accidents is avoided. The action of the machine in hoisting is the same as that of ordinary machines. Lowering is also effected in the usual way, by turning the handles backward; but the action of the safety brake is such that if the handles be let go at any time, either in hoisting or lowering, the load immediately comes to rest. The load is self-sustained, and cannot descend excepting so long and as fast as the crank handles are turned backward by hand.

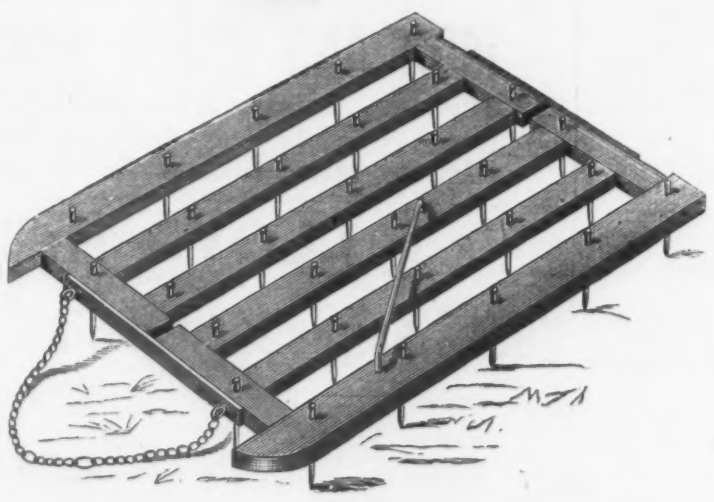
The traverse of the load is effected by the hand chain, which in the illustration the operator is pulling by drawing the small car shown. All the motions of the crane are made with ease and little friction. The mechanism has the merit of being simple, and of being, therefore, little liable to wear out or get out of order, while its cost is no greater than that of other first-class work. The company are building cranes of the type shown in the illustration, of capacities vary-from one to ten tons. They also make cranes of similar construction, but of larger capacities, for operation either by hand or power, all of them, however, embodying Mr. Weston's improvements, particularly the safety feature above referred to.



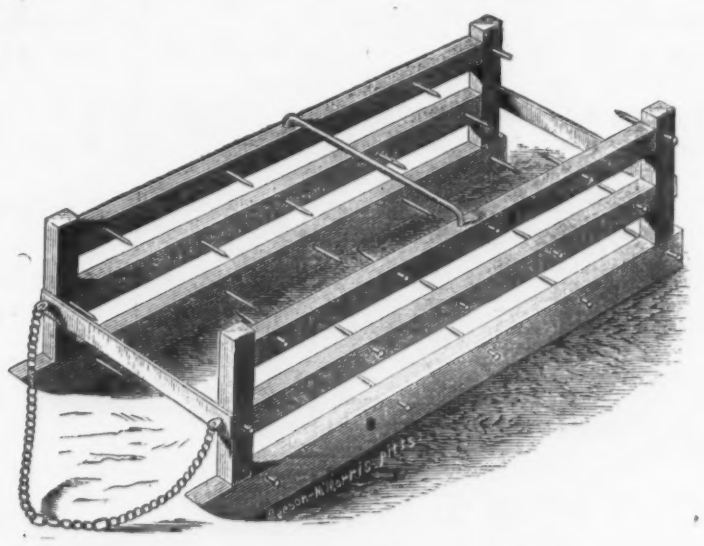
WESTON'S JIB CRANE.

Reese's Sled Harrow.

It is a fact which all connected with any branch of mechanics have probably had occasion to note, that however active the development and application of labor-saving machinery may be in any field, some appliances, escaping attention, pass from generation to generation in their primitive clumsiness. When at last some enterprising inventor, by a simple change, transforms it into an easily handled machine, it seems a matter of surprise to all that the change had not been thought of a century ago. A good example of this is the ordinary harrow, and its young successor, Reese's Sled Harrow. As the accompanying engravings will show, Mr. Jacob Reese, of Pittsburgh, Pa., converts the harrow into a sled, without disturbing a single nut or bolt, simply by turning each half up and then putting on a brace, so that it is not necessary to use a wagon to the field and back to the barn. On the contrary it is even possible, if required, to use the harrow for carrying grain, tools, or implements by placing two boards across the runs. The improvement is so evident that it is hardly necessary to refer to it further.



REESE'S HARROW.



REESE'S HARROW SLED.

SCIENTIFIC AND TECHNICAL.

The *Chemiker Zeitung* contains the following description of a new process of

MANUFACTURING LACQUERS AND VARNISH FROM YELLOW AMBER AND COPAL.

The lacquers made from these materials are remarkable for their hardness and the ease with which they acquire a brilliant polish, but the greatest care must be taken in their manufacture, in order to prevent their becoming black or being covered with greenish spots. Starting from the conviction that these imperfections are due to oxidation during the process of manufacture, Messrs. E. Schrader and O. Dumeke devised the folfollowing appara'us: A cylindrical boiler, made of iron and copper, is put into masonry in an inclined position. The resinous materials are melted by means of superheated steam, which expels the air from the vessel, thus avoiding the danger of oxidation. When melted the material is forced by steam pressure out of the boiler through a tube in its lower part. The temperature is kept well in hand, so that there is no danger of decomposition. The top of the apparatus is provided with a manhole, a safety valve, a pipe to carry off the volatile portions of the rosin, and a stirrer passes through it. The clear material is conducted in pipes, which have vants for the escape of gases. The value of the apparatus consists i: the security it offers for melting large quantities with certainty of success, and in the protection it affords to the workmen.

Mr. Thomas A. Edison read a very interesting paper before the American Association on

HEATING PLATINUM BY THE ELECTRIC CURRENT,

the experiments given bearing largely upon the use of that metal for incandescence lights. The first fact observed was that platinum wire weighing 306 milligrams lost weight at the rate of a fraction less than one milligram per hour as long as it was suspended in a hydrogen flame.

To ascertain the diminution in the weight of a platinum wire when heated by the electric current, he placed between two clamping-posts a wire five-thousandths of an inch in diameter, and weighing 263 milligrams. This wire, after it was brought to incandescence for 20 minutes by the current, lost one milligram. The same wire was then raised to incandescence; for 20 minutes it gave a loss of three milligrams. Afterward it was kept incandescent for one hour and ten minutes, at which time it weighed 258 milligrams, a total loss of eight milligrams. Another wire, weighing 343 milligrams, was kept moderately incandescent for nine consecutive hours, after which it weighed 301 milligrams, showing a total loss of 42 milligrams. A platinum wire twenty-thousandths of an inch in diameter was wound in the form of a spiral one-eighth of an inch in diameter and one-half an inch in length. The two ends of the spiral were secured to the clamping-posts, and the whole apparatus was covered with a glass shade 2½ inches in diameter and 3 inches high. Upon bringing the spiral to incandescence for 20 minutes that part of the globe in line with the sides of the spiral became slightly darkened; in five hours the deposit became so thick that the incandescent spiral could not be seen through the deposit. This loss in weight, together with the deposit on the glass, presented a very serious obstacle to the use of metallic wires for giving light by incandescence, but this was easily surmounted after the cause was ascertained. He coated the wire forming the spiral with the oxide of magnesium by dusting upon it finely-powdered acetate of magnesia. While incandescent the salt was decomposed by the heat, and there remained a strongly adherent coating of the oxide. This spiral so coated was covered with a glass shade, and brought to incandescence for several minutes; but, instead of a deposit of platinum upon the glass, there was a deposit of the oxide of magnesia.

Mr. Edison then placed a spiral of platinum in the receiver of a common air pump, and arranged it in such a manner that the current could pass through it while the receiver was exhausted. At a pressure of two millimeters the spiral was kept at incandescence for two hours before the deposit was sufficient to become visible. In another experiment, at a higher exhaustion, it required five hours before a deposit became visible. In a sealed glass bulb, exhaused by a Sprengel pump to a point where a quarter-inch spark from an induction coil would not pass between points one millimeter apart, was placed a spiral, the connecting wires passing through the glass. This spiral has been kept at the most dazzling incandescence for hours without the slightest deposit becoming visible.

Mr. Edison then describes some very curious phenomena observed in his experiments. If a short length of platinum wire, one-thousandth of an inch in diameter, be held in the flame of a Bunsen burner, at some part it will fuse, and a piece of the wire will be bent at an angle by the action of the globule of melted platinum; in some cases there are several globules formed simultaneously, and the wire assumes a zigzag shape. With a wire four-thousandths of an inch in diameter this effect does not take place, as the temperature cannot be raised to equal that of the smaller wire, owing to the increased radiating surface and mass. After heating, if the wire be examined under a microscope, that part of the surface which has been incandescent will be found covered with innumerable cracks. If the wire be placed between clamping-posts and heated to incandescence for 20 minutes by the passage of an electric current, the cracks will be so enlarged as to be seen with the naked eye. The wire, under the microscope, presents a shrunken appearance, and is full of deep cracks. If the current is continued for several hours, these effects will so increase that the wire will fall to pieces. This defect Mr. Edison found means of eliminating. He made a large number of platinum spirals, all of the same size and from the same quality of wire; each spiral presented to the air a radiating surface of three-sixteenths of an inch; five of these were brought by the electric current up to the melting point; the light was measured by the photometer, and the average light was equal to four standard candles for each spiral just at the melting-point. One of the same kind of spirals was placed in the receiver of an air pump and the air exhausted to two millimeters; a weak current was then passed through the wire to slightly warm it, for the purpose of assisting the passage of the air from the pores of the metal into the vacuum. The temperature of the wire was gradually augmented at intervals of 10 minutes until it became red. The object of slowly increasing the temperature was to allow the air to pass out gradually and not explosively. Afterward the current was increased at intervals of 15 minutes. Before each increase in the current the wire was allowed to cool, and the contraction and expansion at these high temperatures caused the wire to weld together at the point previously containing air. In 1 hour and 40 minutes the spiral had reached such a temperature without melting that it was giving a light of 25 standard candles, whereas it would undoubtedly have melted before it gave a light of five candles had it not been put through the above process. Upon examination of these spirals by the aid of a microscope, no cracks were visible; the wire had become as white as silver, and had a polish which could not be given it by any other means. The wire had a less diameter than before treatment, and it was exceedingly difficult to melt in the oxyhydrogen flame, as compared with untreated platinum. It was found that it was as hard as the steel wire used in pianos, and that it could not be annealed at any temperature.

Mr. Edison claims to be able, by the increased capacity of platinum to withstand high temperatures, to employ small radiating surfaces, and thus reduce the energy required for candle light. He states that he can now obtain eight separate jets, each giving out an absolutely steady light, and each equal to 16 standard candles, or a total of 128 candles, by the expenditure of 30,000 foot pounds of energy, or less than 1 horse-power. As a matter of curiosity, he made spirals of other metals, and excluded the air from them in the manner stated. Common iron wire may be made to give a light greater than platinum not heated. The iron becomes as hard as steel and just as elastic. Nickel is far more refractory than iron. Steel wire used in pianos becomes decarbonized, but remains hard, and assumes the color of silver. Aluminum melts only at a white heat.

At the recent meeting of the American Association at Saratoga, Mr. Albert A. Michelson read a paper on his experiments made to determine

THE VELOCITY OF LIGHT.

His apparatus is the following: A beam of light is allowed to fall through a slit upon a rapidly rotating mirror, from which it is reflected upon a lens of great focal length, throwing the beam upon a plane mirror placed at right angles to its axis. Now, the image of the slit in this plane mirror will again act as an object which will be reflected upon the rotating mirror. While the light has traveled from the rotating mirror through the lens to the plane mirror and back again, the rotating mirror will have changed its position so that the returning image of the slit will not be reflected to the place from which it came, but will move from it. When the rotation of the mirror becomes sufficiently rapid, then the flashes of light will produce a stationary image, which is deflected in the direction of the rotation, and through twice the angular distance, described by the mirror during the time required for the light to travel twice the distance between the mirrors. By accurately measuring the deflection, the distance between the mirrors and the number of revolutions made by the revolving mirror, all the elements necessary for the determination of the velocity of light would be given. An important point was to insure regularity in the rotation of the mirror, and this Mr. Michelson achieved with the aid of the apparatus devised by him. The revolving mirror was set in motion by a blast of air passing through a regulator and acting upon a species of turbine wheel attached to the axis of the mirror. The supply was varied by a valve. To regulate and measure the speed of rotation, a tuning fork, bearing on one prong a steel mirror, was employed. This was kept in vibration by a current of electricity from five gravity cells. The fork was so placed that the light from the revolving mirror was reflected to the piece of plane glass in the eyepiece, thence reflected into the eye. When fork and revolving mirror are both at rest, the eye sees an image of the revolving mirror. When the fork vibrates, this image is drawn out into a band of light. When the mirror commences to revolve, this band breaks up into a number of moving images of the mirror; and when, finally, the mirror makes as many turns as the fork makes vibrations, these images are reduced to one, which is stationary. This is also the case when the number of turns is a sub-multiple. When it is a multiple, or a simple ratio, the only difference is that there will be more than one image. The electric fork made about 128 vibrations per second. No dependence was placed upon this rate, however, but at each set of observations it is compared with a standard Ut4 fork, the temperature being noted at the same time. In making the comparisons the beats were counted for 60 seconds.

The apparatus for measuring the deflection consisted of a screw with divided circle, on which a carriage supporting the eyepiece traveled. The deflection was read on a scale and the circle of the screw. The distance between the revolving and the plane mirror, measured with steel tape and corrected, was found by the mean of several observations to be 1986.35 meters. The rate of vibration of the standard fork was 256.070 vibrations per second at 65° F. From these data Mr. Michelson found the velo.ity of light, from an average of 100 determinations, to be in vacuo 299,828 kilometers per second, or taking one kilometer at 3280.87 feet, 186,298.5 miles.

Prof. J. Lawrence Smith has sent a communication to the French Academy of Sciences, on

ARTIFICIAL WIDMANNSTAETTIAN FIGURES.

Hitherto it has been supposed that the regular figures obtained in etching with acids polished surfaces of meteorites was characteristic, and that they could not be found in material of terrestrial origin. This notion has now been proved by Prof. Smith to be erroneous, as he succeeded in developing figures similar to the Widmannstättian by etching silicide of iron.

Bradford, England, which is the center of the woolen manufacturing industry in that country, will shortly possess a $100,000 technical school. At a meeting of the trustees a few weeks since, the president made the significant admission that Bradford's only hope is in further increasing the variety of its products and in improving their quality and adaptability. The export business in mixed fabrics he scarcely expected would be kept up, as America will in the future take less and less of the low-priced goods formerly imported so largely from Bradford. To his knowledge some of the best artisans were leaving Bradford every week, and he believed a large portion of them were coming to America to take charge of manufacturing establishments as overlookers and mechanics, where they re-

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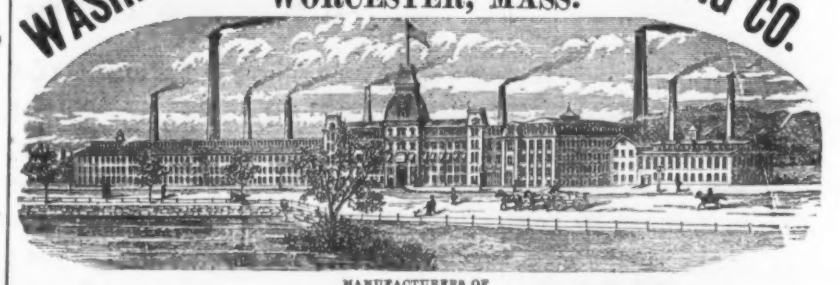
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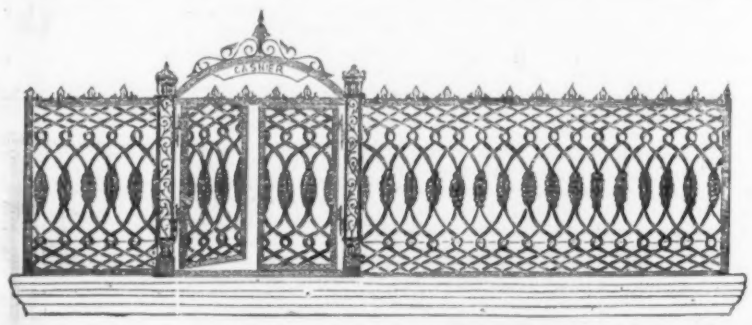
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ceived higher wages than they could obtain in England. There was no doubt, he thought, that American manufacturers were increasing their fabrics very considerably, and Bradford had but little to hope for from the United States in the way of admission for ordinary fabrics.

Novelty in Patents.

As there is hardly a branch in industrial pursuits in which the claims and counter claims of patentees do not at times assume an important aspect, the following able essay, written by Oliver E. Lyman for the *Popular Science Monthly*, will be read with profit, as it clearly defines what novelty in patents is:

By the statute of 1870 it was enacted that an invention, to be patentable, must possess, among other qualifications, that of newness or novelty. But what constitutes novelty is not defined. The solution of the question is left to be determined according to the circumstances of each particular case. It is this fact which makes the question such a difficult one to be answered, for in each case there is generally some little element present which distinguishes it from other cases, and makes it impossible to frame one decided rule of universal application. The question is also rendered less easy of solution from the fact that it comes up most frequently in its most difficult aspect—in cases of infringement, where the point under discussion is, whether the alleged invention is or is not substantially identical with some prior existing thing which has been in common use here or described in some patent or printed publication. Yet, despite the nicety in which this question of novelty is involved, we are not compelled to leave it entirely unsolved A careful study of the subject discloses certain principles which, by their application, somewhat prune down the difficulty. We are fortunate in being able to approach the question from two sides; for, as was true in the case of the two-faced shield, over which those two knights of old story wrangled so long, an inspection of the subject from two points of observation decidedly simplifies matters. The first of these methods of studying the subject I would designate the negative, and the second the positive method. By the negative method we deduce certain principles in regard to cases which have at first sight a color of novelty, but are not novel so as to be patentable. By the positive method we arrive at certain conclusions in regard to what actually constitutes novelty in a patentable sense.

I propose to discuss, first, what cases, at first sight possessing novelty, do not actually possess novelty? A study of cases warrants us in accepting, as a first principle, that every change or mere substitution of a mechanical equivalent is not necessarily a patentable novelty; for it may not be substantially unlike some prior thing. We may have, for instance, a machine, comprising, say, three distinct parts. A man, not the inventor, substitutes for each of these parts other equivalents, producing the same results. This is not a patentable invention. Even if the products be better or cheaper, it is at most only an improvement upon a former invention, and can be used only with the permission of the former patentee.

I spoke above of a "mechanical equivalent." This needs to be defined, in order that we may have a clear comprehension of the above principle. To define it, however, is not so easy. Mr. Parsons has said that "he would be a very acute man who could certainly discern, or a very bold man who would certainly assert, what is meant by a mechanical equivalent." At the risk of being considered bold, certain judges have, nevertheless, ventured to attack the Gordian knot. We find one definition in Smith *vs.* Downing, 1 Fisher's Patent Cases, 87: "By equivalents in machinery is usually meant merely the substitution of one mechanical power for another, or one obvious and customary mode for another, of effecting a like result." This definition is not sufficiently explicit. A better one is to be found in Carter *vs.* Baker, 4 Fisher's Patent Cases, 409: "When, in mechanics, one device does a particular thing, or accomplishes a particular result, every other device known and used in mechanics, which skillful and experienced workmen know will produce the same result, or do the same particular thing, is a known mechanical substitute for the first device mentioned for doing the same thing, or accomplishing the same result. It is sufficient to constitute a known mechanical substitute that, when a skillful mechanic sees one device doing a particular thing, he knows the other device, whose uses he is acquainted with, will do the same thing."

This definition not only covers those elements which come strictly under the head of mechanics, but is also our guide in determining what constitutes an equivalent in an "art," or a "manufacture," or a "composition of matter." The definition of an equivalent of any substance in a composition made of several ingredients, for example, is, in accordance with our guide, any other substance having similar properties and producing substantially the same effect.

So much for the first class of cases, which at first sight are apparently novel, but which in reality are not novel so as to be patentable.

Another class of cases against which the verdict of "no novelty" must be pronounced, is where a new use is made of an old invention. This is no new invention. The mere application of an old invention or means or method of operation to a new use, does not amount to a patentable novelty There is nothing new made by such a proceeding. The use of the thing is perhaps enlarged and that is all. It was upon this principle that adverse decisions were rendered to the claimants in the cases of Losh *vs.* Hague, and Howe *vs.* Abbott. In the first of these, which is reported in 1 Webster's Patent Cases, 205, it was held that the application to railway carriages of a kind of wheel previously in use on common carriages, would not support a patent. In the second case, which is reported in 2 Story, 190, the patentee claimed as his invention a process of curling palm leaf for mattresses. It appeared from the evidence that horse-hair had for a long time been prepared by the same process and devoted to the same purpose. In delivering his opinion Judge Story said: "The application of an old process to manufacture an article to which it had never before been applied, is not a patentable invention. There must be some new process or some new machinery used to produce the result. * * * He who produces an old result by a new mode or process, is entitled to a patent for that mode or process. But he cannot have a patent for a result merely without using some new mode or process to produce it."

Allied to this question of double use, is the question whether a patent can be taken for a particular use of a known machine, when the plaintiff is the first to discover the benefit of such use. As may be supposed, from the place in which I have inserted this question, the answer is "No." And there is justice in the answer; for a man is entitled to all the benefit of an article which he has invented and patented. The man who happens to discover an additional use to which the invention may be applied does not by that discovery and application create a patentable novelty. He devises no new combination of machinery, no new process. Hear what Lord Chelmsford said on the subject. His opinion is to be found in Ralston *vs.* Smith, 11 H. L. C., 256. In this case, by the way, the plaintiff had discovered that by giving a differential motion to different parts of an old machine, a power existing in it might be developed and brought into action. Lord Chelmsford, after stating that he saw no new process, or new combination of machinery, said, "It appears to me that such a discovery is not the subject of a patent." And the same doctrine is laid down in the case of Tetley *vs.* Easton, 2 C. B. (N. S.), 706.

There is another class of cases which demands attention. It sometimes happens that a man seeks a patent for a mere aggregation of things, for example, a hammer with a screw driver inserted in one end of the handle and an awl in the other. The absurdity of granting a patent in such a case is very apparent, and it is no wonder that in the case of Swift *vs.* Whizen, 3 Fisher's Patent Cases, 357, a decision was given against the patentability of the very aggregation given above as an example.

A distinction should be made between such aggregations, when the whole is easily divisible into its component parts, and aggregations where the individuality of the component parts is lost. I would revert to the hammer and screw driver as an example of what I mean by the divisibility of the whole. The hammer can be taken by itself, the awl by itself, and the screw driver by itself, and used. As an example of what I mean by the loss of individuality, take the combined glass cutter, screw driver, can opener, &c., which have been on sale in the streets of late. Here there is but one invention in reality, and the various parts are merged in one whole. The novelty lies in the new combination of the glass cutter, can opener, &c., in such a way that the utility of the parts would be lost by division.

We have now left to discuss the general rule that a mere alteration in the form, size, material or proportions of an existing device is not such a change as to produce patentable novelty. This rule is related to the first one given in regard to the substitution of mechanical equivalents, but it is much wider in its scope. It is laid down in express terms in the second section of the act of February 21, 1793. This declaratory law was not re-enacted in the patent act of 1836, yet necessity and justice compel its recognition; for, as was said in Winans *vs.* Denmead, 15 Howard, 341: "It is a principle which necessarily makes part of every system of law granting patents for new inventions. Merely to change the form of a machine is the work of a constructor, not of an inventor; such a change cannot be deemed an invention."

A very interesting case on this point is reported in 11 Howard, 248 (Hotchkiss *vs.* Greenwood). It relates particularly to the substitution of a new material. In this case a new clay knob was substituted for a metallic knob. It was claimed that there was a patentable novelty. But there was no new mechanical device or contrivance. The knob was not new. The metallic shank and spindle were not new, nor the dovetail form of the cavity in the knob, nor the means by which the metallic shank was securely fastened therein. The only change was in the substitution of a clay for the former metallic knob. Judge Nelson very properly decided that there was no such novelty in this as to warrant the granting of a patent. "This of itself," said he, "can never be the subject of a patent. No one will pretend that a machine, made in whole or in part of materials better adapted to the purpose for which it is used than the materials of which the old one is constructed, and for that reason better and cheaper, can be distinguished from the old one; or, in the sense of the patent law, can entitle the manufacturer to a patent."

So much for the negative method of investigation of the subject of novelty in patents. We have discussed many cases of apparent novelty, and have seen in what novelty does *not* consist. In accordance with the old saw, "You tell me what you're *not*, and I'll tell you what you are," we are now prepared to turn to what I have called the positive method of investigation and learn what *is* patentable novelty.

To answer the question, What is novel, so as to be patentable? is easier than the one we discussed in the first part of this paper. In a few words, there is patentable novelty when there is a different principle of operation; when there is a different result in kind, or when there is a new combination. It is for one or another of these reasons that a patent is ever granted. There may be other grounds apparently, but a closer investigation will show them to be but another species of the above family, and consequently to be classified with them in their application.

The first two of the three principles enumerated can best be treated of together. To repeat, there will be novelty when either the manufacture produced or the manner of producing an old one is new. In the former case there must be something substantially new—different from what was before known. In the latter case the princi-

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ple of the machine must be different; and, as I have shown before, a mere change of the form or proportions will not suffice, if both are the same in principle, structure, mode of operation, and produce the same result. This is true even if there is some small variance in some small matter for the purpose of evasion, or a color for a patent. There must be some principles different from any previously known.

This opens up the ancillary and important question, What is meant by "the principles of a machine?"

In Whittemore *vs.* Cutter, 1 Gall., 478, Judge Story says: "By the principles of a machine is not meant the original elementary principles of motion which philosophy and science have discovered, but the *modus operandi*—the peculiar manner or device for producing any given effect. If the same effects are produced by two machines by the same mode of operation, the principles of each are the same. If the same effects are produced, but by combinations of machinery operating substantially in a different manner, the principles are different."

In deciding whether the principles of a machine are new, there is one block over which we may stumble, and which we should take care to avoid. There is danger of confusing form with principle. The question of what constitutes form and what principle, is frequently a very nice question to decide. Judge Washington, in Treadwell *vs.* Bladen, 4 Wash., 706, has pointed out a road out of the confusion. "The safest guide," says he, "to accuracy in making the distinction, is to ascertain what is the result to be obtained by the discovery; and whatever is essential to that object, independent of the mere form and proportions of the thing used for the purpose, may generally, if not universally, be considered as the principle of the invention."

The third principle above enumerated, that a new combination is a patentable novelty, is well elucidated in the case of Barrett *vs.* Hull, 1 Mass., 474. This was a case for the infringement of a patent granted for "a new and useful improvement, being a mode of dyeing and finishing all kinds of silk-woven goods." Judge Story said: "A patent may be for a new combination of machines to produce certain effects; and this whether the machines constituting the combination be new or old." And in Whitney *vs.* Emmett, 1 Baldwin, 311, also the patentability of a new combination was upheld. What the learned Judge said is so good an epitome of all that has been said in the second part of this paper, that I give it, although it is merely cumulative:

"Novelty consists in producing a new substance, or an old one in a new way, by new machinery, or a new combination of the parts of an old one, operating in a peculiar, better, cheaper, or quicker method, a new mechanical employment of principles already known."

The rule in regard to new combinations, as above laid down, is most just, for the most valuable inventions consist in the combination of known mechanical powers. It makes no matter if some of the elements are old (McCormick *vs.* Talcott, 20 Howard, 405); nor even if every part of such invention can be found in some form or other among the many devices of human ingenuity. As was said in Pitts *vs.* Edmond, 2 Fisher's Patent Cases, 55: "The man who unites these powers and produces a new and important result to society, is well denominated a public benefactor."

There is one important principle in regard to combinations which, although not bearing directly upon the question of novelty, yet ought to be remembered. Judge Story called attention to it in the preceding case of Barrett *vs.* Hull: "It is no infringement," he said, "of the patent to use any of the machines separately, if the whole combination be not used, for in such case the thing patented is not the separate machines, but the combination."

With this quotation I end the discussion of the question of novelty in patents. I have endeavored to make my answer as satisfactory as the difficulties of the question would allow. I have for that purpose viewed the subject from two standpoints of opposite natures, and have enumerated and discussed certain principles of general application which were disclosed by this double observation. The work must at the best, however, be incomplete, for, as Mr. Parsons says, "It is obviously impossible to find precise and technical rules which always answer the question."

A Bridge Made of Old Rails.—The new iron bridge to carry the carriage road over the railway at the Intercolonial station, St. John, N. B., is, with the exception of the hand-railing, which is made of cast-iron posts and gas pipe, built entirely of old rails. The following is a general description of it, taken from the engineer's specification: The clear span is 100 feet; the depth of trusses, 12 feet; width over all, 42 feet. The trusses are of the form known as the "bowstring." There are two roadways, each 13 feet wide, with sidewalks outside of trusses, each 5 feet wide, protected with iron hand-railing. The top chords of the outside trusses consist of two large T-rails (weighing 70 pounds to the yard), and the bottom chord of two U-rails, weighing 56 pounds to the yard. The center truss consists of three large T-rails on top and three U-rails in the bottom chord. The diagonals between chords are U-rails secured to chords with a wrought-iron fastening, riveted into the U, surged down and fitted with bolt and nut. The floor beams are made of T-rails, riveted flange to flange, and secured to chords with angle iron. The floor consists of longitudinal floor timbers, covered transversely with 3-inch planks.

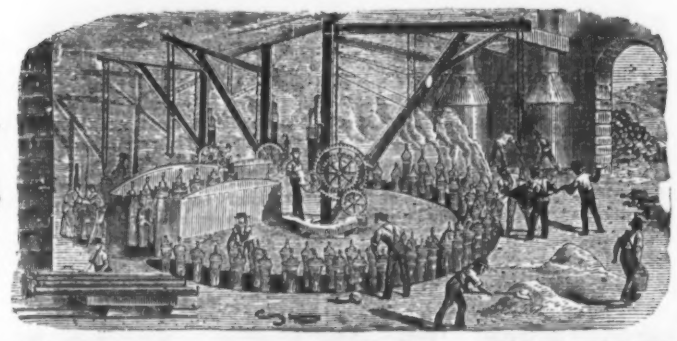
A German paper gives the following figures as the production of metals and coal of the German empire for the years 1877 and 1878, in metrical tons:

	1877.	1878.
Pig Iron	1,956,579	2,124,444
Zinc	90,362	94,954
Lead	80,278	84,374
Copper	8,302	9,541
Tin	881	853
Antimony	939	1,245
Coal	39,423,774	39,429,308
Lignite	10,644,427	10,971,017
Asphalt	39,735	47,389

McNEALS & ARCHER,

BURLINGTON, N. J.

Flange Pipes.



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For Circular, Mulay, Mill, Gang, Drag, Pit and Cross-Cut Saws.

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For Boilers, Fire-Boxes, Smoke Stacks, Tanks, &c.

☞ All our Plate and Sheet Steel being rolled by a Patented Improvement is unequaled for surface finish and exactness of gauge.

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For Shafting, Spindles, Rollers, &c., &c.

File, Fork, Hoe, Rake, R. R. Frog, Toe-Calk, Sleigh-Shoe and Tire Steel, &c.; Cast and German Spring and Plow Steel.

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Finished Rolling Plow Coulters with Patent Screw Hubs attached.
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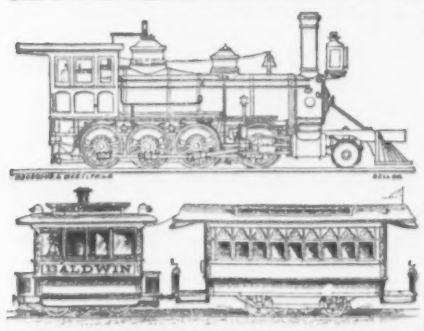

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We also manufacture the Troy Polishing Iron for laundry purposes.

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Can be applied wholly by boring, and is a

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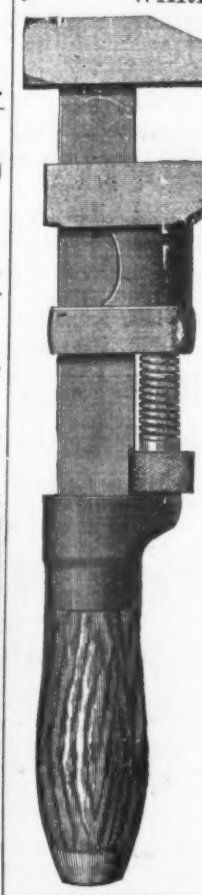

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Nos.	5	6	7	8	9	10
Per lb.	24¢	23¢	21¢	20¢	19¢	18¢

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Glass for Railroad Sleepers.

Engineering, in a recent issue, gives the following details on railway sleepers made of glass, toughened according to the De la Bastie process, which Mr. Frederick Siemens, of Dresden, a well-known German manufacturer, and brother of Dr. William Siemens, is now introducing in England. Some of them have been laid on the line of the North Metropolitan Tramways at High street, Stratford. The sleepers in this case are of exactly the same section as the wooden longitudinal sleepers they have replaced, namely, rectangular, 4 inches wide by 6 inches deep, the upper side being molded so as to accurately fit the rails. They are laid in lengths of 3 feet, and to avoid the danger of settlement at the joints, bearing plates 10 inches by 5 inches by 1¼ inch are placed at these points, these plates being also utilized for effecting the securing of the rails by a fastening which obviates the necessity of molding any holes in the glass. The samples of the sleepers above mentioned have been tested by Mr. Kircaldy, and their average breaking weight, when resting on supports 30 inches apart, has been found to be about 5 tons, this being probably about two-thirds of the resistance which would be afforded by a good pine sleeper of similar dimensions. It must, however, be borne in mind that whereas the timber would become depreciated by use, the glass promises to be practically indestructible by moisture, &c.

At the works of Mr. William Henderson, a plate of Mr. Siemens' toughened glass 9 inches square by 1⅛ inch thick, imbedded in gravel ballast 9 inches deep, and having on its top a wood packing ⅛ inch thick and a piece of rail, was subjected to the action of a falling weight, the blows being delivered on the rail. The weight was 9 cwts., and blows were successively delivered by letting this weight fall from hights of 3 feet, 5 feet 6 inches, 7 feet, 10 feet, 12 feet 6 inches, 15 feet, 17 feet 6 inches and 20 feet. Under the last mentioned blow the rail broke, the glass, however, being uninjured. As a higher fall could not be obtained and a greater weight was not available, a smaller section of rail was substituted for that previously employed, and the glass was broken by a second blow of the 9 cwts. falling 20 feet, the plate being driven through the ballast into the hard ground. A cast-iron plate 9 inches square and ½ inch thick, tested in a similar way, broke with a blow from the 9 cwts. weight dropped 10 feet.

The cost of the toughened glass is stated to be about the same per ton as that of cast iron, but as its specific gravity is only about one-third that of iron, the cost of any article of given dimensions is, of course, materially less. The material has as yet been too recently introduced and too little is known of its characteristics, to enable any very decided opinion to be formed as to its future capabilities; but the results of the experiments so far made with the material are certainly of an exceedingly promising character, and the further development of its applications will be watched with much interest.

Industrial Education in England.

Mr. James Samuelson, President of the Liverpool Science and Art Classes, who has been closely identified with industrial education for many years, gave to the members of the American Association assembled at Saratoga, the following account of the object and the working of the Science and Art Department of the Committee of the Privy Council on Education, founded by an "order in Council," February 25, 1856, under the provisions of an act of Parliament. The object of the department is to promote science instruction chiefly among the industrial classes, and the means employed are:

1. Payments to teachers on results shown by the annual May examinations. These examinations are conducted simultaneously all over the three kingdoms by printed papers prepared by the examiners, who are selected from the leading scientific men.

2. Queen's prizes, being scientific books selected by the successful students from a catalogue sent down by the department; also gold and silver medals (competitive), one of which is given for each branch of science.

3. Exhibitions, scholarships, studentships, &c. Among these are "studentships for training," which give the student the privilege of attending the science classes at South Kensington at the charge of the State; also the well-known Whitworth scholarships of £100 per annum for three years for practical and theoretical proficiency.

4. Grants toward a building fund for the erection of science schools.

5. Grants toward apparatus and school fittings.

6. Laboratory grants.

7. Payments in aid of training teachers.

The subjects in which instruction is given are 24 in number, and the number of schools in which instruction is imparted, chiefly in the evenings, is at present nearly 1500.

For some time after the foundation of the department only five towns responded, and of the five schools so founded one or two were unsuccessful, and were closed. In 1861 Mr. Samuelson founded the Liverpool School of Science, the first established there, and the system was already so far developed that there were enrolled between 100 and 200 students. In 1867 there were 213 schools in Great Britain, giving instruction to about 10,000 of both sexes; in the session of 1876-1877, 1348 schools, with over 55,000 students. Owing to stricter regulations being enforced, the number of students diminished in 1877-1878, being 52,330, but the schools multiplied, there being 1484, with 4559 classes. The fruits of the system are widespread. Every large town has many schools, London alone having 165, and the smaller towns, and even villages, have their classes, the students of which are often more successful than those of the more important centers of learning and industry.

The department aids the various localities in founding a school, which is accomplished in the following manner: A committee of gentlemen, not less than five in number, and one of whom must be a clergyman or magistrate, is formed in any locality for the purpose of managing the classes. This committee places itself, through its secretary, in communication with the department, engages the teachers, who must be "certificated," and so the "science school" is formed. All payments are made to the committee, who may, if they please, retain one-fifth of the teachers' fees for cost of management. In order to understand the mode of proceeding it is necessary to pass on to the May examinations. The papers at these examinations are framed to include six grades of students, who may pass as follows: Elementary, first and second class; advanced, first and second class; honors, first and second class. As soon as a student has passed in the second class of the advanced stage, he is entitled to earn payments on results; in fact, he is a "certificated" teacher of the department. He must give 25 lessons (class lectures) in any subject which he teaches before he can receive payment for his instruction. This payment is in proportion to the degree of success attained by his pupils, and in no case exceeds £4 ($20) for each student. As a matter of fact, any industrious and intelligent student may enable his teacher to earn this amount.

A few of the subjects taught are: Biology in all its branches (including botany and vegetable physiology); physics (acoustics, light and heat, magnetism and electricity); physical geography, now known as "physiography;" every branch of mathematics; chemistry (organic and inorganic); building construction, steam naval architecture, geology, mineralogy, mining, &c.

The advantages of the system are summed up by Mr. Samuelson as follows: "It is making our men better mechanics. It is training 50,000 people to-day to think systematically, and to reason without passion or prejudice; to appreciate your 'Cooks' and your 'Ingersolls,' and by their influence to enable those about them to form correct estimates of the value of public utterances on scientific and philosophical questions. It is enabling many young persons who would have drudged at the desk or counter all their lives to earn an additional income by science teaching, and others to form a higher estimate than their ordinary avocations present of life and of the world in which they live. It is influencing our homes, by giving to people about to enter life more rational views of sanitary matters, and all others pertaining to health and disease; and, last but not least, it is expanding the views of young people, educated it may be in some rigid, restricted, though devotional, school of thought, and making them more charitable in their opinions of those who differ from them on religious questions. In fact, it is materially beneficient to the teacher, morally advantageous to the taught and beneficent in its general influence on society."

Mineral Statistics of Great Britain for 1878.

Mr. Robert Hunt, who has for almost 30 years collected the mineral statistics of Great Britain, has just issued his report for the year 1878, from which we glean the following figures, giving the mineral produce in tons:

Coal	132,607,866	Silver ore	94
Iron ore	15,726,370	Nickel ore	98
Tin ore	15,045	Arsenic	4,991
Copper ore	56,034	Fluorspar	391
Lead ore	77,350	Clays, &c	2,711,486
Zinc ore	25,438	Salt	2,682,930
Iron pyrites	29,867	Barytes	22,435
Manganese	1,586		

The quantities of metals obtained from these ores were, it appears, as follows:

Gold	Ounces.	702
Pig iron	Tons.	6,381,051
Tin	"	10,106
Copper	"	3,952
Lead	"	58,020
Zinc	"	6,309
Silver from lead	Ounces.	397,471
" ore	"	27,643

It may be of interest to show, with a few figures, how seriously foreign competition affected the mining of tin and of copper. In the case of the former metal the output has remained stationary, but since 1873 the value of the market product and the number of mines sharing in it have decreased by one-half. The following table will plainly show this:

Year.	Number of mines.	Tin ore. Tons.	Met. tin. Tons.	Value.
1873	215	14,885	9,972	£1,056,835
1874	230	14,039	9,942	788,210
1875	183	13,995	9,614	735,606
1876	185	11,688	8,500	600,923
1877	98	14,142	6,510	572,763
1878	92	15,045	10,106	530,7 7

In copper the falling off is more serious still, as the following data will show:

Year.	Mines.	Ore, tons.	Cop'r, tons.	Value.
1866	173	180,378	11,153	£1,019,168
1868	152	157,335	9,817	761,602
1870	124	106,658	7,176	551,309
1872	117	91,893	5,703	533,232
1874	119	78,521	4,981	447,891
1876	101	79,252	4,694	392,300
1878	85	56,034	3,952	271,042

On the other hand, the quantities of foreign copper ore and regulus smelted in England has increased very considerably, as the following figures, which include the output of the English mines themselves, will show:

	Ores, regulus, &c. Tons.	Copper. Tons.
1871	399,624	29,953
1872	408,419	27,405
1873	481,413	31,996
1874	604,038	32,875
1875	638,034	33,800
1876	545,021	40,885
1877	651,308	58,068
1878	792,425	61,994

There have been strikes from all manner of ridiculous causes. One that occurred in Central America recently, as narrated by a correspondent of the New York *Tribune*, seems funny, but it is not more so than many that are occurring frequently in this country. It seems that this arose from the introduction of a watch to regulate the hours of labor. The men had adopted the theory that a certain donkey employed on the work brayed accurately at 4 o'clock (the quitting time) each afternoon. So long as the timepiece and the donkey agreed approximately, no difficulty was encountered; but one day the watch was half an hour slow, or the jackass brayed half an hour ahead of time, and the men nearly revolted in a body because the watch was decided by the foremen to be the more reliable timepiece.

AUBURN FILE WORKS,

Superior Hand-Cut

FILES AND RASPS,

MADE FROM IMPORTED STEEL. EVERY FILE WARRANTED.

FULLER BROS., Sole Agents,

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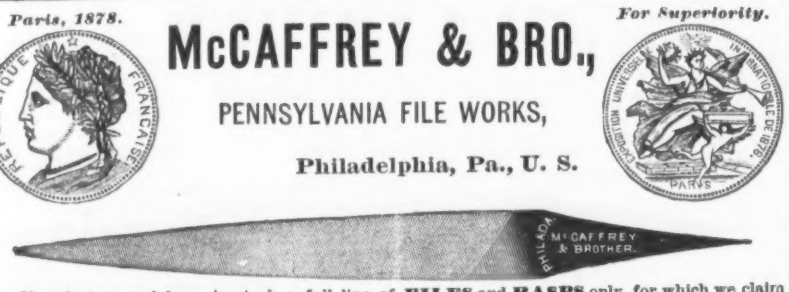
Paris, 1878. *For Superiority.*

McCAFFREY & BRO.,

PENNSYLVANIA FILE WORKS,

Philadelphia, Pa., U. S.



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Superiority acknowledged wherever used, sold or exhibited.

SNELL MFG. CO.,

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MANUFACTURERS OF

Augers, Auger Bits,

BORING MACHINES & BORING IMPLEMENTS.

TENNIS & WILSON,

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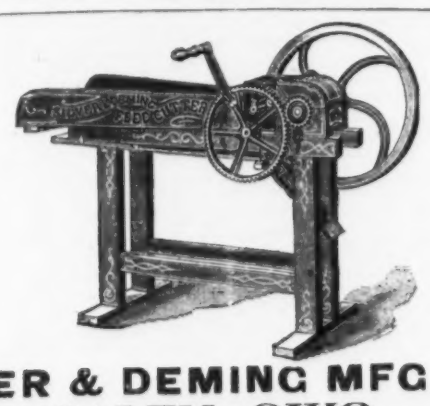
Manufactured from Extra Cast Steel and warranted.

SOLE MANUFACTURERS OF

Rice's Patent Superior Boring Machines and Snell's Upright Machines.

Snell's Solid Cast Steel Augers, Auger Bits, Car Bits, Screw Driver Bits, Taper Pod Gimlets, Taper Pod Gimlet Bits, Countersink Gimlet Bits, Long Millwright Augers, Long Rafting Augers, Coopers' Doweling Bits,

AND ALL KINDS OF MACHINE BITS MADE TO ORDER.



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THE SILVER & DEMING FEED CUTTER.

Seven sizes for Hand and Power. The most popular Feed Cutter in America.

Send for prices and discounts.

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BEST PORCELAIN-LINED LEMON SQUEEZERS.

"Common Sense" Mouse Traps.

HAND-MADE ROSEWOOD FAUCETS.

Housefurnishing Hardware.

FOR HOME AND EXPORT TRADE.

WM. R. HARTIGAN, Burlington, Ct.,

Manufacturer of all kinds of

TOOL HANDLES AND SEAT STICKS FOR CARRIAGES, &c.

Also all kinds of Enameled Goods made of wood, such as Drop Knobs, Furniture Knobs, Organ Stops, Brush Handles, &c., &c. Also sole manufacturer of the Patent ANTI-NERVOUS TRIANGULAR PENHOLDER. Send for Catalogue and Price List before purchasing. F. R. EMMONS, Agent, 131 Duane St., New York. Manufactory at BURLINGTON, Conn., U. S. A.

[See advertisement in *The Iron Age* of September 4, 1879.]

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ALBANY, NEW YORK, U. S. A.,

Manufacturers of

IMPROVED FARM IMPLEMENTS AND MACHINERY.

FILES & RASPS,

Established 1858.

Best Cast Steel. HAND-CUT. Manufactured by

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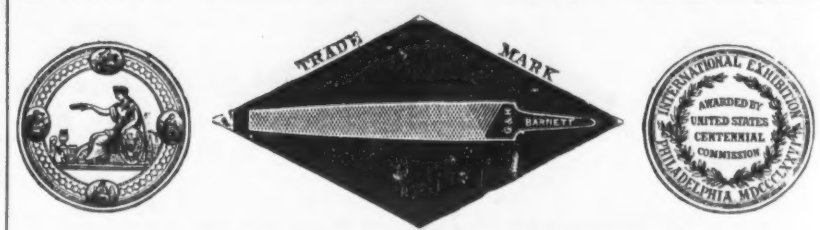

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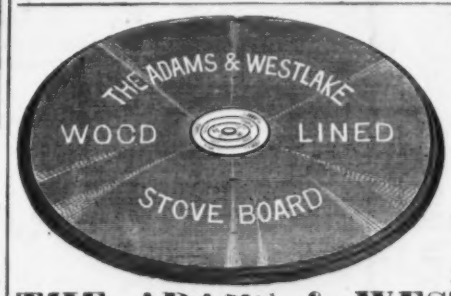

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Nashville, Tennessee, as an Iron Center.

To the Editor of The Iron Age.—I have received from various quarters numerous inquiries as to the facilities offered by Nashville for the making and manufacture of iron, which I desire as briefly as possible, after thorough investigation of the subject, to answer through your columns. I wish to say at the outset that either the cost of making iron at Pittsburgh has been greatly overestimated by those engaged in the business, or the figures which I shall give make a startling and most favorable exhibit for Tennessee. My estimates for Pittsburgh are based upon letters received in Nashville from prominent and trustworthy iron men, and there can be little doubt of their correctness. They do not certainly err in being too high. The estimates for Tennessee are based upon careful inquiry, widely extended, embracing every possible scrutiny to avoid error, and calculated with due allowance for any variations that can be reasonably expected in contract prices or freight. I expect them to be carefully examined, and I invite the most searching inquiry. If I am right, inquiry will not fail to show it, and the world should know the facts. If there is a flaw anywhere, investigation will not fail to detect it.

Middle Tennessee possesses two classes of iron ore—the brown hematite or hydrous oxide, and the red hematite or anhydrous oxide. The last is limited in extent, and confined to two or three banks near Clifton, in Wayne County, about 100 miles southwest of Nashville. Rich specimens, however, are found associated with the hydrous oxides at other points. Brown hematite is found in workable quantities and of excellent quality in Stewart, Montgomery, Houston, Dickson, Humphreys, Hickman, Perry, Lewis, Wayne, Decatur, Benton and Lawrence. These counties lie from Montgomery on the northwest around to Lawrence, a little west of south from Nashville, the nearest county being Dickson, due west about 30 miles. The most distant are Wayne and Lawrence, about 100 miles at the furthest point in the Alabama line. This is the great Western iron belt, running north and south entirely through the State, and embracing over 5000 square miles. It is traversed by the Cumberland River in the counties of Stewart and Montgomery, about 75 miles by river below Nashville, where the Cumberland enters into the iron fields of Kentucky.

Of the various forms of hydrous oxides in Middle Tennessee, the chief are:

1. Pot ore—hollow concretions, stalactitic, botryoidal and velvety on the interior surface. From crust to interior are various layers with different shades of brown, having a varied crystallization. A very valuable ore.

2. Pipe ore, which resembles reeds agglutinated; rust colored, and very highly prized by furnacemen.

3. Black Jack ore—a compact black or bluish ore, rich, but more refractory in the furnace than the two first mentioned.

4. Honeycomb, filled with small cavities, sparry and easily smelted.

5. Brown-clay ironstone, having contorted laminæ, like a mass of adhering and closely compressed shells, concretionary and sparry.

6. Shot ore—small angular masses, never much used alone, usually obtained from screening other varieties.

7. Bog ore—rough, pock-marked, porous, spongy and siliceous. Never used to any extent, though abundant in places.

8. Yellow ocher—soft, crumbly, dull and earthy.

Associated with these, and more especially with the pot ores, is turgite, and for that reason often taken for hydrous oxide, but really an anhydrous oxide. It often constitutes one of the concretionary layers that form the hollow ball-like mass, but it may be distinguished from the hydrous oxide by its superior hardness, its red streak, and by its decrepitation. The line between this and the hydrous oxide is very distinct, and the cohesion is very slight. The presence of turgite gives great richness to many of the banks in the Western iron belt, and analyses of specimens show 63 per cent. of metallic iron, and even more when disassociated from the hydrous oxide.

Still another valuable associate is gœthite, or fibrous hematite (needle ore or anegite), found in the Western iron belt. This, though a hydrous oxide, contains a very small percentage of water and about 90 per cent. of the sesquioxide of iron. This ore is not so abundant as the turgite, but adds great value to the banks in which it occurs. The presence of these two ores makes the brown hematite of the Western iron belt resemble those brought from Bilboa, Spain.

The following are analyses of ores made by J. Blodgett Britton, of Philadelphia. The first specimen is from Cumberland Iron Works, Stewart County, taken from the north side of the Cumberland River, and the second is from the south side:

	North side.	South side.
Pure metallic iron	57.84	59.22
Oxygen with iron	24.37	24.88
Water	11.96	11.06
Insoluble siliceous matter	3.59	3.21
Soluble silica	0.78	0.13
Sulphur	none.	none.
Phosphoric acid	0.54	0.36
Alumina	0.13	0.49
Lime	0.05	0.17
Manganes	0.03	0.06
Manganese, undetermined matter and loss	0.71	0.42
Total	100.00	100.00
Phosphorus	0.24	0.16

A specimen from Bear Spring Furnace, Stewart County, gives as analyses by Prof. Burton:

Water	10.94
Silica	4.77
Metallic iron	59.98
Oxygen combined	20.70
Sulphur	0.11
Phosphorus	0.40

A dozen analyses might be given of ores from Stewart and Dickson counties, showing metallic iron, sulphur, phosphorus and silica. Those given are, however, fairly typical. Take one limonite, however, from Lawrence County, in the extreme South, from a bank on the dividing ridge between Knob and China creeks:

Water	11.83
Silica	1.01
Iron	59.60
Iron with oxygen	25.54
Sulphur	0.16
Phosphorus	1.06

One specimen taken from La Grange Furnace, in Stewart County, on the Tennessee River, shows, as analyzed by Prof. E. S. Wayne, 65.75 per cent. of metallic iron. Another specimen from the same place, analyzed by Prof. Barton, gives:

Water	3.65
Silica	1.90
Iron	*65.02
Oxygen combined	28.25
Sulphur	0.04
Phosphorus	0.12

Another specimen from Stewart County, analyzed by the same chemist:

Water	8.38
Silica	2.19
Iron	63.09
Oxygen combined	27.03
Sulphur	0.07
Phosphorus	0.13

The first of the last two were gœthite and the last turgite. The same character of ore may be found on many of the banks in every county of the Western iron belt.

The three ores, analyses of which I have given, namely, limonite, gœthite and turgite, when pure turn out as follows:

Limonite.	85.6	ses. oxide iron =	59.92	metallic iron.	
Turgite...	94.7	" "	66.25	"	"
Gœthite.	89.9	" "	62.92	"	"

The best ores from this belt, with the imperfect means of smelting, turn out from 50 to 54 per cent. of metallic iron. The run of the mines will yield from 42 to 45 per cent.

The iron product of Tennessee, with few exceptions, is either neutral or slightly cold-short. Red-short iron has been made in Dickson County. Any amount desired can be made by bringing the easily accessible Iron Mountain ores to Nashville, at a cost not exceeding $7 per ton. As to the amount of iron ore to be had in the Western iron belt that is accessible, both by river and rail, it is sufficient to say that many of the banks cover from one to five square miles, and the ore is from a few feet to 100 in thickness. In some of the countries it forms great bluffs on the small streams that interpenetrate every portion of the iron field; in others the ore lies deep beneath the surface, but generally it is found cropping the hills and ridges that separate the stream beds. Some of these banks have been worked for half a century with no sign of exhaustion. In a word, the ore exists in such abundance that it is practically inexhaustible.

I now propose to give some figures to show the relative cost of making iron at Pittsburgh and at Nashville, not with the view of displaying the disadvantages of Pittsburgh, but the advantages offered by Nashville.

It is claimed that 1½ tons of Republican (Lake Superior) ore will make 1 ton of pig iron in the furnaces at Pittsburgh; but since mill cinder enough is always used to make 1-10th of a ton, we may infer that 1 6-10th tons of Republican ore are required to a ton of pig iron. The most favorable estimate of cost claimed by workers of Pittsburgh furnaces is as follows:

Cost of Material for Ton of Pig Iron at Pittsburgh.

1 6-10 tons of Republican ore at Cleveland at $7	$11 20
Freight from Cleveland to Pittsburgh, $1.90 per ton	3.04
Transfer at Pittsburgh at 10c. per ton	.16
Total cost of ore for ton pig iron	14.40
Coke, 80 bushels at 4c	3.20
Limestone, three-quarters ton at $2	1.50
Salaries and labor per ton	2.00
Contingent expenses	.50
Total	$21.60

Cost of Material for Ton of Pig Iron at Nashville.

The cost of material and labor for making a ton of pig iron at Nashville, the furnace to be located on a railroad, is as follows, taking average ore:

2¼ tons of ore, delivered, at $1.50	$3.37
80 bushels coke at 4.3c	3.44
Limestone	.50
Salaries and labor	2.00
Contingent expenses	.50
Total	$9.81

These figures are a startling exhibit. Let them be examined minutely. Every point can be thoroughly investigated, and every one will be thoroughly established. It is strange that capital has not occupied such a field if this be the truth. Capital is slow to adventure, however—even to inquire—and then slow to occupy. The world is full of similar cases of slow conservatism waiting for years before it acquires the courage to occupy, or even to investigate, fields which when developed have been found sources of individual wealth and national prosperity. For 300 years after the discovery of America the rich prairies of the Northwest, now the granary of the world, were unoccupied, and thought to be valueless.

In many places in the Western iron belt a man can raise from four to six tons of iron ore a day, especially at the iron bluffs overhanging ravines, as in Hickman County, where the ore can be shuted on board the cars. One man can average daily three tons. Contracts can be made for ore to be delivered on the cars at 60 to 65 cents per ton; freight, 80 miles to Nashville, 80 cents and royalty, if the iron banks are not owned by the furnace, 10 cents, making the whole cost, including royalty, from $1.50 to $1.55 per ton. The estimate of the cost of labor and salaries per ton of pig produced, is based upon information received at a locality where two furnaces, each producing 50 tons per day, are in operation.

The following cost of making a ton of iron at Nashville, was recently made by a Pennsylvania manufacturer who spent some time in investigating the subject:

2 tons ore at $1.50	$3.00
85 bushels coke at 5c	4.25
Limestone	.50
Sand for casting	.10
Labor and repairs	2.25
Incidentals	.50
Total	$10.60

I am assured, however, that the price of coke is placed too high. In none of the estimates has the interest on investment been included, but as the investment would probably be less in Nashville than in Pittsburgh, owing to the comparative cheapness of real estate and building material in the former place, it would not change the relative results in any considerable degree.

Nashville is situated on the Cumberland River, navigable from December till June, and oftentimes throughout the whole year for small steamers. Within a few miles to the west it has the vast Western iron belt, extending out of Kentucky into Tennessee

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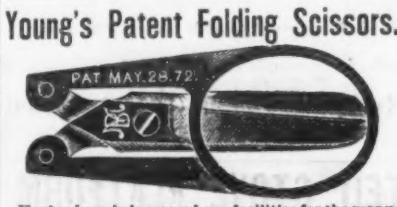

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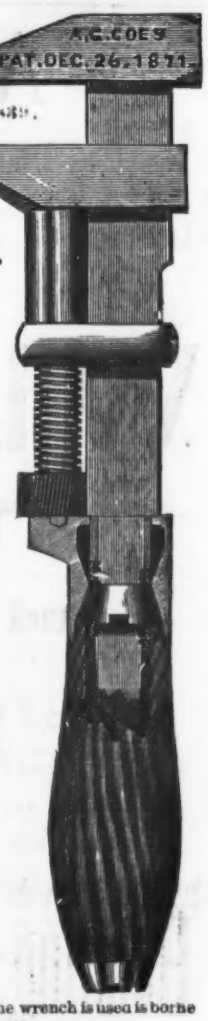

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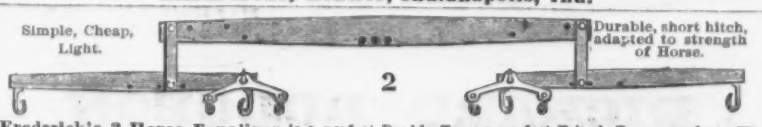

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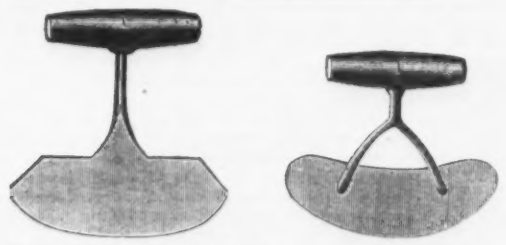

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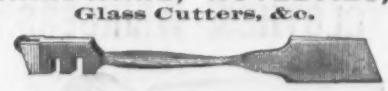

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and crossing into Alabama, accessible now by the Cumberland River; by the Memphis division of the Louisville, Nashville and Great Southern Railroad; by the Tennessee River connecting with the Nashville, Chattanooga and St. Louis Railroad at Johnsonville; by the Nashville and Tuscaloosa Railroad, a branch of the N., C. & St. L. R. R. from Dickson's Station, now building, to cut the great iron banks of Dickson and Hickman counties, and already completed to large and valuable banks. The ores of Iron Mountain are accessible by the Nashville, Chattanooga and St. Louis Railroad and the Iron Mountain Railroad, which are connected by the Mobile and Ohio Railroad at Union City and Columbus, Ky. The great Clinton (dyestone) ore seams of Alabama are within easy reach by the Decatur branch of the L., N. & G. S. R. R., connecting with the North and South Railroad at Decatur. In addition, there are iron fields along the western spurs of the Cumberland Tableland, to which the Manchester and McMumville Railroad, a branch of the N., C. & St. L. R. R., is graded and built within a few miles. This, however, is purely speculative. The great and virtually inexhaustible sources of the best ore is the Western belt, with Alabama and Iron Mountain ores easily accessible for manufacturing all grades of pig iron.

The Appalachian coal field, about 60,000 square miles in extent, passes clear through Tennessee, from northeast to southwest. Of this 5100 square miles are in Tennessee, covering, in whole or in part, 21 counties, and including the whole of the Cumberland plateau. This plateau bifurcates near the longitudinal center of the State, one prong ending a short distance within Alabama, the other prong narrowing at the fork and then spreading out, in the shape of a heart, in Alabama, giving to that State about 4000 square miles of valuable and rich coal area. Nashville now reaches these fields, 106 miles distant by rail, in Grundy County, at the Sewanee Mines; in Franklin County, at the University Mines; in Marion County, at the Battle Creek Mines, the Ætna Mines and the Vulcan Mines—all by the Nashville and Chattanooga Railroad and its branches, except the two mines first mentioned, which are reached by the Tennessee Coal Company's railroad, connecting with the N. & C. R. R. at Cowan. Coal from the Appalachian field is also obtained from Kentucky by the Cumberland River above Nashville, and by the Decatur branch of the L., N. & G. S. R. R. from Alabama.

The Illinois coal measures extend into Kentucky, beginning at Rome, on the Ohio, and running nearly to the mouth of that river and nearly over the western end of Kentucky, to within a few miles of Hopkinsville, 70 miles from Nashville. This is now one of Nashville's large sources of coal supply by the Evansville, Henderson and Nashville Railway, which cuts the coal measures, and along which many extensive mines have been opened.

Recently the Nashville and Chattanooga Railroad purchased the Owenboro and Nashville Railroad, contemplating its extension between Nashville and the Ohio River, cutting a very rich portion of the coal measures.

These are the sources and means of reaching iron and coal now. The figures given are carefully made up from examination into the prices at which iron and coal can now be furnished. They show what can be done with these sources and the present means of reaching them.

As to transportation, Nashville now has the Nashville and Chattanooga Railroad, connecting with the East Tennessee, Virginia and Georgia road and the Atlantic, Mississippi and Ohio Railroad with the seaboard at Norfolk and with the Southern system of roads to the Gulf, also soon with the Cincinnati Southern at Chattanooga. It has connection with the Mississippi River and with St. Louis by the Northwestern branch of the Nashville, Chattanooga and St. Louis Railroad, and very early the same road will complete a new connection with the Ohio River and Chicago by the Owenboro road, while it is now pushing a road into the iron field south west along the Tennessee River. We have the Louisville, Nashville and Great Southern Railroad giving connection with Louisville, Cincinnati and Indianapoles on the north; on the south with Montgomery, Mobile and New Orleans, and with the Mississippi River on the west, and by the Evansville branch reaching St. Louis, Chicago and other great centers of trade. At least six months in the year there is river connection with Louisville, Cincinnati and St. Louis, and also for a like period we have river connection at Point Burnside with the Cincinnati Southern Railroad, by the Upper Cumberland, during the busiest iron transporting season, giving a competing line to Cincinnati as a check upon the Louisville, Nashville and Great Southern Railroad, in case a check is needed.

Nashville is also amply supplied with labor available at present, while it is the center of an agricultural region, both in the central basin and on the river lands, unsurpassed in fertility and variety of soil and productions, contributing an unfailing and easily and cheaply available source of home-produced food; and, added to this, excellent transportation facilities for supplies from abroad.

As to local conveniences, furnaces may be established directly on the railroad and on the river, and occupy any desirable or convenient situation near the road as to elevation. The railroads are all connected so that terminal facilities are the very best for receiving coal and ore and shipping iron, while Nashville is built on limestone, cropping out everywhere and rarely more than 4 feet beneath the surface, requiring slight labor to raise, and now obtainable at less cost than I have given in my estimate.

The advantages possessed by Nashville for making iron may thus be summarized:

1. Ores easily mined and smelted.

2. Transportation of ore by the Tennessee River and Northwestern Railroad, by the Cumberland River from Kentucky and Tennessee, by the Memphis branch of the Louisville, Nashville and Great Southern Railroad from Montgomery, Stewart and Houston counties to Guthrie, and from thence by the E. H. and N. R. R. to Nashville; by the Decatur branch of the same road from Alabama, and by the Nashville and Tuscaloosa Railroad from Hickman and Dickson counties, connecting with the Northwestern Railroad at Dickson.

3. Available ores of great variety for the manufacture of any desired grades of iron.

4. Supplies of good coal from Kentucky, Tennessee and Alabama, making an arc of coal fields around Nashville of 220 degrees, all reached by river or rail.

5. Abundance of good limestone for flux, costing only blasting and cartage.

6. Nearness to St. Louis and Cincinnati markets by numerous lines of transportation insuring equitable rates of freight.

7. Abundance of cheap labor.

8. Mildness of climate, giving an annual average of from 10 to 15 degrees of mean temperature above the iron centers of the North.

9. Fertility of soil, excellence of climate and water, food cheap and abundant—and hence labor cheap and abundant. Mildness of climate also makes living cheaper, and, consequently, labor cheaper.

10. Smaller investment of capital necessary to secure iron and coal properties.

11. The superior quality of Tennessee iron made from the brown ores of the Western iron belt have been tried and found equal to any in use, and capable of standing the severest tests.

This is a plain statement of facts, which any one may verify by investigation.

J. B. KILLEBREW,
Commissioner of Mines.

NASHVILLE, TENN., Aug. 29, 1879.

The Howson Mechanical Puddler in France.

M. Escalle, engineer of the famous Terrenoire Company, France, prepared for a recent meeting of the Iron and Steel Institute a paper on the Howson mechanical puddler (which we illustrated in *The Iron Age* of January 4, 1877, and November 9, 1878), and the experiments made with it at Tamaris, Gard, France. Owing to press of business the reading of the paper was postponed, but we have been favored with a copy from which we make the following abstract:

The object of this paper is: 1. To acquaint the members with the results which we have obtained in the first trials of the Howson apparatus, laid down at Tamaris in June, 1878. 2. To place before them the reflections suggested by these first trials. Both the principles and the general arrangement of the Howson puddler are well known. Its characteristics are: Suppression of the puddling furnace, blowing a mixture of hot air and gas on the surface of the liquid metal in a kind of converting vessel, oblique rotation of this vessel upon a pivot, mechanical stirring of the molten mass, and finally the formation of a single ball which the machine, overturned in the same way as the Bessemer converter, brings on to the floor of the mill. In September, 1877, I saw this appliance in operation at the Britannia Works, Middlesborough, in the Cleveland district. M. Jullien, manager of the Terrenoire Co., having decided to give it a trial, it was erected during the spring of 1878 at the Terrenoire Works, and put in operation in the beginning of June. The apparatus is placed about 80 meters from the blast furnaces, near a steam hammer and a train of cogging rolls. The pig iron is either charged cold, or is run in in a melted state from a reverberatory furnace, or again directly from the blast furnace. The gas is supplied to the apparatus by a Wilson closed gas producer, blown by means of a small jet of steam. The air which enters into combustion with the gas in the converter is supplied by the foundry cupola blast pipe, and heated in the hot-air pipes, which form part of the apparatus. The rotary motion is imparted to the converter by means of a small portable engine. Lastly, the operation finished, the movement of overturning is given by hand by means of an endless screw arrangement. I should add that the apparatus is constructed for a maximum charge of 160 kilograms (352 lbs.) of pig. Since the first operations several difficulties have been encountered. In the first place it became necessary to refettle the converter on several occasions. It was also necessary to make several trials before arriving at a regular working of the gas producer; but, after the first irregularities inevitable in such attempts, the apparatus has worked with sufficient regularity, and enables us to form a preliminary opinion as to its value.

As a first satisfactory result, we noted the perfect and literally automatic stirring of the metal, and the complete and rapid incorporation of the 10 to 15 kilograms (22 to 33 lbs.) of rich slag added to the pig as a reducing agent at the commencement of the operation. Another result to be noted is that the formation of the single ball was not accomplished at Tamaris so easily as at Middlesborough. As a rule, we found that the ball was formed better whenever the charge was greater.

In all the operations, even those that were least successful, the hand labor was not to be compared with that necessitated by ordinary puddling. Several times, especially when the charge was at its maximum, the workmen had only very little to do. The ball was formed and was detached perfectly well by itself by the simple action of the apparatus. The ball thus formed was always compact, very even on the surface and well rounded, although slightly oblong. This clean and easy detachment of the ball produced a very favorable impression upon those who witnessed the operation. Its duration is from 25 to 50 minutes when molten metal is charged in, and from 45 to 60 minutes when the pig is put in cold.

The balls thus obtained are easily hammered and cogged. The greater weight of the balls, however, renders their management difficult, especially at the steam hammer. Our steam hammer, however, was sufficiently powerful to hammer these balls of 140 to 145 kilograms (308 to 319 lbs.), but we could not deal with balls of greater weight. The hammer is one of 2500 kilograms (2½ tons). The puddled bars have a much better appearance than those obtained by ordinary puddling, although they both present the same qualities either hot or cold.

What is less satisfactory is the result of the accounts of these first days of manufac-

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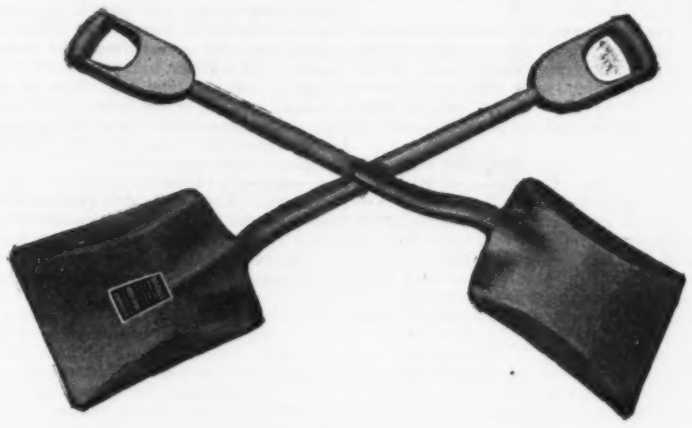

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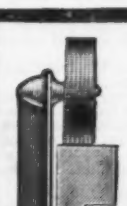

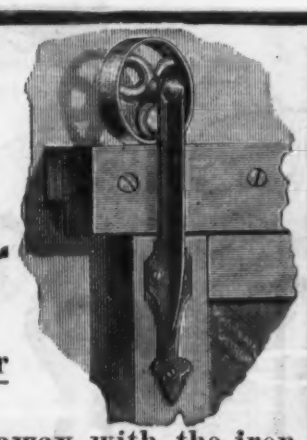

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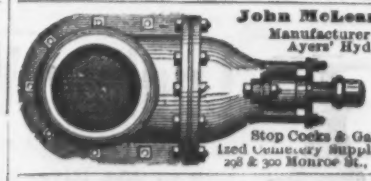

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ture. In the various operations the loss has varied from 6 to 24 per cent. Without being able as yet to account entirely for such a great variation, we have, at any rate, remarked that the greatest amount of loss corresponds to charges which were put in cold and those of a slight weight. On the other hand, it is when using metal run directly from the blast furnace, especially when a maximum weight is charged, that we have obtained the least amount of loss.

The consumption of coal has been from 1000 to 1500 kilograms per 1000 kilograms of puddled iron obtained, not including the coal consumed in the reverberatory furnace when we have employed remelted pig, nor that necessary to work the steam hammer and cogging rolls. As the ordinary puddling furnace always yields the steam necessary for the first working of the iron produced, the suppression of this source of steam requires that it be replaced, and it is important to keep this circumstance in mind while discussing the merits of the Howson apparatus.

The favorable results, then, afforded by these first trials are: Perfect stirring, easy formation of the ball when the charge is made of molten metal in sufficient quantity, and satisfactory appearance and quality of this ball and of the bar which it yields after cogging. On the other hand, there is a greater uncertainty as to what may be the exact loss and the cost of fuel, which has hitherto been excessive. But in speaking of the advantages which the Howson apparatus is capable of affording, there is one which I have purposely reserved until the last, because its singularity, as well as its importance, appears to me worthy of especial attention. I refer to the dephosphorization of the pig effected by the Howson apparatus with dry working and at a low temperature.

When my attention was called to this fact in England by Mr. Howson himself, I experienced a certain degree of perplexity. On the one hand, I could not doubt the assertion of one so competent and so honorable, and, on the other, I could not help saying to myself that these assertions were at complete variance with the general practice at our works, where dephosphorization only takes place in puddling at a very high temperature, and with a considerable amount of boiling. The first analysis of the products of the apparatus soon convinced me that their dephosphorization was equal or superior to that of the irons obtained by ordinary puddling. In order to make myself better acquainted with this phenomenon, I took out of the same tapping some metal which I caused to be puddled simultaneously by the two methods. I added to this pig 10 kilograms of basic slag in the Howson apparatus, and from 50 to 60 kilograms in the ordinary furnace. The iron resulting from these two puddlings were submitted to analysis, and during the month of June I caused this double puddling, and the analysis of the irons yielded by it, to be repeated several times. I found that on starting with a pig, containing on an average 0.85 of phosphorus, we arrived at the figures of 0.322 in the ordinary puddle bar, and of 0.286 in the iron puddled by the Howson apparatus. There was, then, a difference of 0.036 in favor of the latter. There was no longer room for doubt that dephosphorization had taken place at a low temperature and dry—that is to say, with a very slight addition of slag; but the question now was: What becomes of the phosphorus that thus disappears? According to Mr. Howson, all this phosphorus must become concentrated in the slag that remains. Now, the quantity of residue is always approximately equal to that of the slags added at the commencement of the stirring. The analysis of the slags, taken before and after the operation, gave 2 per cent. of phosphorus in the first class, and 3 per cent. in the second. Now, according to the hypothesis of Mr. Howson, not 3 per cent., but 11 to 12 per cent. of phosphorus ought to have been found in the slags at the operation. The hypothesis of Mr. Howson being thus discarded, we find ourselves in the presence of 8 per cent.; that is to say, out of 10 kilogroms (22 lbs.) of slag, a quantity of 800 grams (1¾ lbs.) of phosphorus, the disappearance of which is not explained by the analysis. This considerable quantity was evidently not in the dephosphorized iron, and it did not reappear in the slag. What, then, had become of it? Must it be supposed that the phosphorus is evolved from the apparatus, and in what state is it disengaged? I do not open the discussion to which this question may give rise; I only note the singular fact of this dephosphorization by dry puddling, and at a low temperature, and its importance in metallurgical practice.

Such are the results afforded by the first trials of the Howson apparatus, and I will now make a few short observations suggested by them. The first relates to the charging. The Howson apparatus does not seem at present capable of working regularly with charges lower than 150 kilograms (330 lbs). Besides, always referring to the experiments at Tamaris, this apparatus would appear to require the use of molten metal, which entails two disadvantages. In the first place, the balls obtained with a charge of 150 kilograms (330 lbs) are not easily worked or handled with the plant now in use at our iron works. Next, the necessity of employing molten metal may oblige us to adopt the alternative either of providing melting furnaces, causing additional loss and expense for fuel, or of erecting the puddlers quite close to the blast furnaces, a great undertaking, and one which, in many cases, would lead to serious difficulty. I may add a single observation as to the loss. It has varied from 24 to 6 per cent. This latter figure would, it is true, be satisfactory if it could be obtained regularly. Can the working of the apparatus be mastered sufficiently so as to achieve this result? I have every reason to think so, although we have not yet attained to it at Tamaris. I have been reminded, it is true, that the first Bessemer plant put down gave rise at first to enormous loss, soon reduced to just proportions by a better understanding of the working conditions of the apparatus, and by an increase in the weight of the charges. I think the first of these causes will sufficiently reduce the loss in the Howson apparatus. As to the increase of the charges, I have enumerated the difficulties brought about by it.

At first sight the consumption of fuel, which was, at Tamaris, from 1000 to 1500 kilograms (1 to 1½ tons) of ordinary coal per ton of puddled iron, is absolutely discouraging, and so much the more so as fuel is consumed for working the steam hammer and the cogging rolls besides, but it must be borne in mind that this excess of consumption is due to causes which are quite accidental. We have never worked regularly; besides, the Wilson gas producer, which was always working, would have sufficed not merely for a single apparatus, but certainly for two, and probably for three.

We can now affirm that with the regular working of two or three machines the cost of fuel would fall to 300 (660 pounds), perhaps to 250 kilograms (one-quarter ton) of coal per ton of puddled iron, which is an excellent result. I would add that the gas-producer of Mr. Wilson is an excellent apparatus. The inventor who proposed to utilize the fuel of inferior quality for heating by means of gas, has thoroughly succeeded.

I will add nothing to what I have just said as to the elimination of the phosphorus. This fact, entirely to the advantage of the Howson puddler, consitutes one of its greatest merits.

By way of summing up, I would say that there exists between the advantages and the disadvantages which our first trials enabled us to ascertain with regard to the Howson machine, the following balance:

That its advantages, as perfection of stirring, the easy formation and exit of the ball and the elimination of a large portion of the phosphorus, are inherent in itself. While its disadvantages, as the necessity of employing the pig in a liquid state, and of dealing with larger masses, all depend upon circumstances which are separate from, and it may be said extraneous to, the apparatus, circumstances which longer trials may ameliorate. And why should I not terminate this paper by saying that we have undertaken these trials at our works especially in the hope of at last banishing from our ironworks that most laborious part of the work, so hard and distressing, which hand puddling imposes on a large number of hands. It is this thought which should lead all men of large heart to hope that the Howson apparatus may happily leave the period of trial in which we see it at the present moment.

Steamboating on the Hudson.

A reporter for *The Iron Age* has obtained from the contractors interesting particulars concerning a superb new iron steamer, to be built immediately for the Albany Day Line on the Hudson River. The Harlan & Hollingsworth Company, of Wilmington, Del., will construct the hull, and the engine, boilers, &c., will be from the works of Fletcher, Harrison & Co., West street, New York. This boat will differ in several essential particulars from any heretofore put afloat. First, she is the pioneer metal steamer in the river passenger trade to Albany. Another distinguishing feature is the transfer of the boilers from the guards, or main deck, to the hold, thus not only changing the entire appearance of vessels of this class, but making available a large space for the accommodation of passengers, which, until now, was required for the boilers. More than this, the removal of so large a weight from the guards to a point near the keel will impart great stiffness and stability to the craft. The first idea was to build a composite boat, *i. e.*, have an iron waist from the gunwales to within 18 inches of the water-line, and a bottom of wood, covered with copper. Copper was preferred, because calculated to secure greater speed, being smooth, or "slippery;" but on account of strength and lightness, the parties concerned finally decided on iron. Steel would have been lighter yet, but rather more costly, and, as the boat will run so much in fresh water, this consideration had little influence. Wood is the least costly material which could have been used, and the composite plan next higher in the scale in this respect.

A fact of special interest, and not intended for the public, is a sort of experimental test to be made in the boat here described, to determine the comparative durability of iron and steel, a certain number of plates or a certain section being assigned for this purpose.

The dimensions of the hull will be 300 feet on deck and 285 feet at the water line, 40 feet breadth of beam and 67 feet over all, with 11 feet 6 inches depth of hold and 5 feet draft of water. The engines will be similar to others now in use, with a cylinder 73 inches in diameter and 12 feet stroke of piston. There will be three boilers instead of two, on account of the peculiar arrangement below deck, all of the "lobster back" pattern and 8½ feet in diameter, with two furnaces to each, and each will have an independent smoke-stack, which is entirely novel. In regard to the diameter of wheels and other details, nothing is yet decided.

The hull was modeled by Mr. Foulke, of the old shipbuilding firm of Lawrence & Foulke, who is conceded to be the master in this line of art since the days of Collyer Bros., now deceased, and from the repute enjoyed by Fletcher, Harrison & Co., who are now building Engine No. 93 in their list, it is more than probable that the new steamer will realize the fullest expectations.

The same firm have a contract for rebuilding the Chauncey Vibbard, for the same company, it being the intention to put this steamer in hand immediately at the close of navigation, so that she can run as companion for the new boat in the coming spring. Like her consort, she will have three boilers below deck, making room for commodious passenger saloons forward and aft, both on the main and promenade decks. The iron steamer already commenced will cost approaching $175,000.

In reference to current rumors, it can only be said that certain capitalists have had in contemplation an independent line to Albany, to consist of first-class steamboats built of steel, but the Day Line people seem to have got the start, and what the effect of this last movement will be is not yet apparent.

The Iron Age

AND

Metallurgical Review.

New York, Thursday, September 11, 1879.

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CONTENTS.

The British *Trade Journal* is inclined to be complimentary to the misguided Americans who, having respectfully declined to follow good British advice, and gone on in their own blind way in search of national prosperity, are just now experiencing the consequences. We quote as follows:

We cannot call the competition of a country like America foreign competition, as it comes from an Anglo-Saxon nation of the same stock as ourselves; but, looking at it in trade light, it is a foreign competition, and one of a very serious nature. Although Americans are distant cousins of ours, they do not owe a particle of relationship, or evince the slightest sympathy in the progress of our affairs, except to circumvent them as far as possible, and this they are doing with considerable success in many parts of the world. Though so young, as compared with old England, the United States are making gigantic strides in all directions; and in so doing the Americans show that they have all the perseverance, the doggedness and the pertinacity of the British nation, conjoined with a certain well-defined freshness of ingenuity and adaptability which we have not got to anything like the same extent. The energy which they display in all that they undertake is a feeling developed by the consciousness of possessing inexhaustible resources, and by the exuberance of a constitution which is even now only beginning to feel the strength of thews and sinews. It would be better for us English, both employers and employed, if we took a little more trouble to study the industrial position of America, with which very few, comparatively, are acquainted.

This is really very pleasant, and the concluding paragraph is eminently true. The dense ignorance of the average Englishman respecting the history, geography, statistics, social organization and industrial position of this country is something phenomenal, and we suspect that in many cases it is studiously affected. The average American is generally, and often specially, well informed about England and English affairs. To the representative Englishman there is nothing surprising in this fact; but it is a perpetual surprise to Americans who travel in Great Britain, how little its people know of this country or of the happenings on this side of the Atlantic.

The American Association for the Advancement of Science.

The American Association for the Advancement of Science recently met at Saratoga, and within the space of a few days dispatched a vast amount of business. The work done by this large and influential scientific body is not intended to be confined to an interchange of opinion and a mutual communication of the results of the labors of a limited number of scientists. Its sphere of usefulness is extended far beyond these narrower limits, and embraces the enlightenment of the public at large, to whom it offers the means and extends facilities for a wider dissemination of scientific truth. As the newly-elected president, Prof. G. F. Barker, of Philadelphia, tersely put it in his opening address, the association has for its object the advancement of science, not only by the discovery of new truth, but also by the diffusion of that already known. This duplex character of its aims is reflected in its proceedings, which deserve and have obtained the careful consideration of the technical journals and the press in general. The papers really assume the shape of addresses, general and historical, discussions of certain branches of science, and of contributions to a more restricted field, embodying the latest researches of some specialist. The former class appeal more especially to the general public, while the latter claim the attention and call out the views of a few scientists working in special fields. The recent meeting has been eminently successful in both directions. As striking examples of able, popularized expositions of the successes of special branches of science, we may cite Prof. Marsh's address on the "History and Methods of Paleontological Discovery," of which we printed an abstract in the last issue of *The Iron Age;* Major Powell's "Mythologic Philosophy;" Prof. Peirce's paper on the "Sidereal Universe," and Prof. Barnard's exhaustive essay on the "Past State of the World's Metrology as Bearing on the Progress of Science." Preeminent among the records of special scientific research, are Mr. Michelson's "Experimental Determination of the Velocity of Light," Prof. Riley's "Philosophy of the Pupation of Butterflies," Prof. Leeds' "Solubility of Ozone in Water," Prof. Bell's papers on new experiments with the telephone, Prof. Morley's "Variation of the Proportion of Oxygen in the Air," and Edison's "Phenomena of Heating Metal in Vacuo by Means of an Electric Current." Of some of these papers we shall give careful abstracts, based, whenever possible, on the original papers submitted. We need now refer only to one matter.

In his inaugural address, Prof. Barker has touched a subject upon which his views are hardly in accordance with what he professes to consider the true object of the association whose president he has just become. We refer to his utterances on the relations between the scientist and the inventor. He is reported to have said, in substance, that the scientific discoverer has been in the past, and is very generally in the present, independent of the inventor and has preceded him, and that men appreciate the invention because it has a money value and enriches their pockets. He claims that the discovery of the fact which is afterward usefully applied, is obviously of far more importance than the mere application of it, and that therefore original research should be more fully recognized and encouraged by our men of means. The man, he says, who patiently investigates truth for its own sake, and resolutely denies himself the good things of this life that he may obtain it, is more worthy of high honors than the hero of a thousand battles. There is implied in this an antagonism, or rather a jealousy, of inventors on the part of scientists which we believe ought not to exist. No one should be less ready to give way to it than the president of the Association for the Advancement of Science, one of whose greatest missions we conceive to be to furnish the means of approach between men whose cooperation would do much to better the condition of the human race. We appreciate the efforts of men who deny themselves the good things of this life in searching for truth for its own sake, but we fail to see the necessity of their abstinence, and believe that they are perfectly justified in looking into the practical sides of the scientific questions which they are so well trained to observe. The time when it was considered below the dignity of a scientist to follow out his researches to their applications has as certainly passed, as the days in which an inventor might ever night stumble across valuable improvements in industry or the arts. At the present time, the scientific training required to develop an invention into the full utility of which it is capable, is becoming more and more exacting. The future, even more than the present, will call for men who combine broad scientific knowledge and practical experience. To them men of means will never deny assistance.

There is perhaps no country in which this is so well understood as in ours, and in which scientists are so quick to perceive the practical value of their discoveries. In industrial pursuits also the importance of a close scrutiny of recent research is fully appreciated. We know of no better example of this recognition than is found in metallurgy, and notably in the manufacture of iron and steel. Prof. Barker, we believe, does wrong in speaking slightingly of the application of scientific discoveries. The discovery and the application are equally important, and not until this fact is fully recognized will both the discoverer and the inventor reap the full benefit of their labors, whether they are seeking pecuniary reward or the gratification of having found truth for its own sake.

Our Commercial Interests in Egypt.

The precise amount of American products which Egypt consumes it is not easy to ascertain, inasmuch as the statistics of the Treasury Department at Washington only mention our direct dealings with Turkey, of which Egypt forms a part, while *via* Malta a considerable trade is going on all the time under the Greek Flag, furnishing the Egyptians petroleum and other American products. There is, however, no doubt that Egypt is consuming a good many of our American exports, and is capable of absorbing our domestic manufactures to a greater extent in the future. But aside from our present and future commercial relations with Egypt, that country, now forming the high road between the East and West, is directly or indirectly of great interest to us, and recent events have again directed to her the attention of the world at large very particularly. Availing ourselves of statistics embracing the year 1877, just published by the Egyptian government, we shall endeavor to cast some additional light upon the actual status of that country, and draw some conclusions as to its probable future.

The growing political, strategical and commercial importance of Egypt has, ever since the great French revolution, been practically recognized by England and France. Napoleon I, under the banner of the first French republic, made an abortive and disastrous attempt to conquer Egypt, England successfully thwarting his undertaking. In 1840, but for the meekness of Louis Philippe, king of the French, Egypt would have kindled a conflagration involving all the great warlike powers of Europe. Since the Crimean war a better understanding, fortunately, prevails between the two great western nations, and although England was at first hostile, from mere jealousy, to the French engineering enterprise of cutting the Suez Canal, a proper understanding in the interest of both and of the world at large, has now been established between England and France with respect to Egypt and its financial and political control. Although not formally guaranteed internationally, the neutrality of the Suez Canal and the adjacent country is tolerably well secured, for should France be unwilling or incapable of defending it, there would be Russia, Germany and Italy, together with the remaining maritime nations, to do so. England, it is true, has assumed a practical and legitimate control of a financial nature by buying the former Khedive's canal shares, but the other maritime nations will never allow her to misconstrue this lien into a right of military occupation. Still, it cannot be denied that the possession of the shares in itself implies a hidden threat, inasmuch as a first class European power is the owner, and it was so felt and understood in France and elsewhere when the first news of Great Britain's purchase was made known. At all events, it serves as a warning in view of the eventual cutting of a Central American canal. Colombia and Nicaragua are weak States, subject to continual revolutions, the former in particular, and its most important province, Panama, has during the past six months been repeatedly the scene of unbridled anarchy, bloodshed, and consequent insecurity to passengers and goods in transit between oceans.

The proper safeguards are necessary to protect international interests confided to a region where the framework of government rests on the success at "pronunciamientos" of any robber-politician. Hence the deep interest which the American people take in the future of these countries, through which the highway of interoceanic commerce will lie.

As for international interests in connection with the Suez Canal, it seems almost too late now to place matters relating to them on a less equivocal and more acceptable footing. The Suez Canal has become a great commercial fact; it has revolutionized the trade with the East, and has to be dealt with as one of the great achievements of modern skill and enterprise, speaking volumes in favor of a similar canal on this side. It has, besides, in the course of the past few years proved an eminently profitable undertaking, and while in its gloomiest days its shares declined to 20 per cent., they are now worth 140 per cent. Inseparable as this international highway is from a politically safe condition of the country it traverses, the status of Egypt herself is not a matter of indifference to the outside world, and the new government just installed, it is hoped, will allay all apprehension in this respect. It is believed that it will be more economical and less corrupt than its predecessor, and that the poor fellahs will be better protected against a grinding despotism, the greediness and land grasping of money lenders and from famine.

Egypt is divided into

	Area square miles.	Population.
Egypt proper	230,003	5,602,627
Nubia	330,000	1,000,000
Soudan (Dar Fur) Harar	320,000	10,800,000
Total	880,000	17,402,627

The population of Egypt proper includes 85,000 foreigners, of whom 34,000 are Greeks, 17,000 Frenchmen, 14,000 Italians, 6200 Austrians, 6000 Englishmen and 1100 Germans. The principal cities are:

	Population.
Cairo (19,120 foreign)	349,883
Alexandria (47,316 foreign)	212,034
Damietta (50 foreign)	29,383
Rosette (10 foreign)	15,002
Suez (2400 foreign)	13,498
Port Said (4210 foreign)	8,671

and besides Tanta, 60,000; Zagazig, 40,000; Syout, 27,470; Damanhour, 25,000; and Mansoura, 16,170 inhabitants.

The increase of population by immigration is slow, there being an excess of arrivals over departures during five years (1873–77) of, together, 19,191 souls; the excess of births over deaths, together, 1,054,383 between 1846 and 1877 in Egypt proper. As it is, it takes 108 years to double the population of Egypt, while in Greece it takes 42 years, in Roumania 74 years.

The following has been the trade movement:

EGYPT'S TRADE WITH FOREIGN COUNTRIES.
(*In Thousands of Dollars.*)

		Import.	Exp'rt.	Tot'l.	Tot'ls.
Great Britain	1874	14,315	50,400	64,715	
	1875	15,719	49,352	65,071	
	1876	12,380	49,367	61,747	
	1877	12,830	45,010	57,840—	249,373
France	1874	4,006	7,454	12,350	
	1875	5,378	6,920	12,298	
	1876	4,106	6,876	10,982	
	1877	4,015	7,771	11,786—	47,426
Austria	1874	2,295	4,103	6,398	
	1875	2,754	3,626	6,380	
	1876	2,225	2,635	4,880	
	1877	2,382	2,460	4,842—	22,500
Italy	1874	1,141	1,451	2,592	
	1875	1,403	2,623	4,026	
	1876	904	2,455	3,359	
	1877	929	3,877	4,806—	14,783
Ind., Chi. & Jap.	1874	1,125	11	1,136	
	1875	1,478	5	1,483	
	1876	523	....	523	
	1877	884	....	884—	4,026
Turkey	1874	424	2,004	2,428	
	1875	354	2,044	2,398	
	1876	168	1,852	2,020	
	1877	436	2,027	2,463—	9,309
Russia	1874	379	1,286	1,665	
	1875	236	1,190	1,426	
	1876	300	3,654	3,954	
	1877	46	1,498	1,544—	8,589
United States	1874	332	106	438	
	1875	288	97	385	
	1876	201	199	400	
	1877	502	179	681—	1,904
Greece	1874	75	302	377	
	1875	109	254	363	
	1876	115	224	339	
	1877	94	246	340—	1,419
Other countries	1874	208	85	293	
	1875	209	154	363	
	1876	217	118	335	
	1877	194	321	515—	1,306
Totals	1874	25,201	67,203	92,404	
	1875	27,929	66,261	94,190	
	1876	21,138	67,402	88,540	
	1877	22,302	63,369	85,701—	360,835

The three principal custom houses participated in collecting duties on imports in the following proportion. Alexandria, 95 per cent.; Damiette, 10 per cent., and Port-Said-Suez, 4 per cent.

IMPORTS.
(*In Thousands of Dollars.*)

	1874.	1875.	1876.	1877.
Woven goods	7,660	8,772	7,479	8,091
Coal	3,889	4,749	2,819	3 218
Clothing and boots and Shoes	1,427	1,676	1,349	1,047
Preserves	1,103	1,206	929	529
Liquors and beer	742	797	931	622
Oils	746	816	489	804
Indigo	503	946	767	604
Yarns	613	671	641	661
Iron and manuf	773	481	741	526
Lumber	799	717	509	426
Sugar, refined	486	558	500	689
Drugs	340	415	356	291
Candles	307	321	314	299
Machinery	300	132	343	174
Silk	375	196	65	216
Skins	191	199	221	173
Cabinetware	249	260	166	75
Paper	156	177	185	230
Other goods	4,482	4,838	2,313	3,639
Total	25,201	27,927	21,139	22,334

EXPORTS.

Cotton	48,091	44,003	43,551	35,578
Breadstuffs	3,729	8,810	10,476	10,889
Cotton seed	6,515	6,180	7,236	8,079
Sugar	3,610	2,496	2,254	4,653
Guns	1,333	1,119	874	835
Skins	588	554	562	624
Ostrich feathers	822	520	382	401
Wool	377	367	574	435
Rags	228	231	332	360
Ivory	243	425	159	306
Wax	59	150	71	59
Other goods	1,607	1,404	983	1,140
Total	67,202	66,268	67,404	63,369

ARRIVALS AND DEPARTURES OF MERCHANT CRAFT.

	Coastwise — Ves.	Coastwise — Ton.	Seaward. — Ves.	Seaward. — Ton.	Totals. — Ves.	Totals. — Ton.
1873.	7,526	210,963	14,797	7,877,939	22,323	8,088,902
1874.	9,535	245,677	13,880	9,403,264	23,415	9,648,941
1875.	12,043	349,581	13,283	8,120,982	25,326	8,476,563
1876.	7,282	225,163	13,945	9,106,304	21,227	9,331,467
1877.	5,899	199,444	13,592	8,726,867	19,491	8,926,311
Tot.	42,285	1,230,828	69,497	43,241,356	111,782	44,472,184

The above figures include the vessels which took their transit through the Suez Canal.

TONNAGE OF ARRIVALS AND DEPARTURES BY PORTS.

	Alexandria.	Port Said.	Suez.	Other Ports.
1873	2,791,831	3,389,717	1,533,560	373,794
1874	2,755,211	4,810,452	1,702,793	380,703
1875	2,326,576	3,728,355	1,937,148	482,486
1876	2,369,557	4,124,242	2,286,487	540,121
1877	2,211,412	4,212,236	2,034,858	417,803
Total.	12,456,387	20,264,984	9,548,846	2,203,969

There are engaged in field labor in Egypt proper 1,855,385 persons; in various pursuits, 591,230; and the priesthood embraces 274,749 individuals. The sexes are about equally divided.

While our war lasted and for the ensuing year or two, cotton had become a valuable product, and even the fellah began to prosper in his way. Since then the Khedive has made strenuous efforts to encourage the cultivation of the sugar cane, which would also have proved tolerably profitable in the rich soil of the banks of the Nile, if he had gone to work in a less hasty and extravagant manner. The outlay for sugar houses and machinery, under the advice of interested parties, was by far too great, and although the Khedive had the satisfaction of stamping out of the ground, so to say, a great sugar production, it did not prove a profitable industry, taken as a whole, the less so as prices remained depressed through the competition of beet-root and colonial sugar. The Egyptian bondholders in reality had to foot the shortcomings, the same as they have had to foot the many private fancies—especially in an architectural way—of the Khedive.

On May 7, 1876, the amount of money borrowed by the government and by the Khedive on his own territorial possessions since 1861, was £54,793,150, and this, together with the old floating debt (£36,206,850), was consolidated in a 7 per cent. bond issue, aggregating some £91,000,000, to which there must be added of new floating debt £9,243,928. The present debt, therefore, amounts more or less to some $500,000,000 of our money. To pay the interest thereon, with the cotton crop last year a partial failure, and while the taxes in the bulk had to be collected from the fellahs, starving as they were, has been a difficult matter; hence the financial supervision instituted by England and France on behalf of the bondholders, finally leading to the abdication of the Khedive in favor of his son.

Egypt's merchant navy consists of 555 sailing vessels of, together, 30,909 tons, and 30 steamers of 28,965; joint number of vessels, 585; tonnage, 59,874. Of railroads there were last year in operation 1116 miles; telegraphs, 4127 miles; length of wire, 8757. The post office received and forwarded between 1873 and 1874 (fiscal year), 1,908,944 inland letters and 417,657 foreign ones.

Although poor crops will occasionally occur through irregularities in the inundations of the Nile, the average result is satisfactory, and the resources of Egypt in soil, climate and cheap labor are such that, under a less extravagant administration, the country may be made to prosper again, and its finances and general status may be materially improved, while raising the poor laborer to a condition of less abject slavery than the one he now occupies. One of the reforms which the financial condition of Egypt imperatively demands, is the abrogation of exemption from taxes which foreigners enjoy under cover of the so-called "capitulations."

English Journals and American Rails.

During the last few weeks we have had occasion to note that the English press, in some cases unwittingly, and in others, we fear, intentionally, is misunderstanding and misinterpreting the situation of the rail trade in this country. While we regret the errors of the first class, we emphatically protest against the unwarranted and senseless attacks of the second—unwarranted, because there has never been any disposition on the part of the leading trade journals and general press of this country to belittle what is great in English industry and engineering; and senseless, because the statements made, if true, would have an effect just the opposite of what they are intended to produce. As an example of the crude and erroneous views of some journals, we would cite those printed in the London *Times*, while we would point to the *Engineer* as a leader of those papers which appear to be ready to seize any occasion to print misstatements calculated to injure the reputation of American manufactures.

To American readers the following passage, written by a correspondent of the *Times*, is news of the freshest kind:

A reaction has lately been going on in the United States in favor of iron rails, which the iron trade of South Wales has already begun to feel in the shape of some welcome American orders. This partly arises from the fact that, though the life of a steel rail is longer than that of an iron one, the latter can be converted when worn out, and thus commences a new life. But it is doubtful, after all, whether, assuming each kind of rail to be of the very best, there is so much difference in the wearing qualities. An iron rail has been lately exhibited at the American Institute of Mining Engineers which was made in 1870, and has since carried 67,000,000 gross tons of freight, carriages and engines. With all this immense strain during nine years, the rail was only worn at the top of the head for three-sixteenths of an inch. Perhaps, after all, the iron age is not so near its extinction as has been prophesied.

Commenting upon this, the *Engineer*, after correcting some of its more obvious errors, says:

The true reason why American railway companies begin once more to regard iron with favor, is that the steel rails made in America are really very bad. They are brittle, and yet soft. For a long time past the steel works of the United States, with a few honorable exceptions, have strained every nerve to get out quantity regardless of quality. Already it has been found advisable to pay an extra price to England for a good article, and if American steel masters pursue their present suicidal policy, it is not unlikely that a good demand for steel rails may spring up in this country for the United States. But English ironmasters must be careful to supply only superlatively good rails, or they will kill in a moment the demand which is only just beginning to breathe.

Briefly, the true reason why American railway companies take iron is because they cannot get steel. Some of them, however, have so high an opinion of steel rails, as

compared with iron rails, that they are willing to go to England to cover their demands. To any one who has read the market reports of *The Iron Age*, these facts are perfectly familiar. All our steel rail mills are so overrun with orders that they can only enter into new contracts specifying delivery far into the next year. Those of our railways whose managers have been forced to replenish supplies without delay, have turned to the iron rail manufacturers, not because of "a reaction in favor of iron," but on account of pressing need. There are many well-authenticated cases of both English and American iron rails which have shown an exceptionally good record; and there can be no doubt that the same mills—for instance, the Philadelphia and Reading—to which the English correspondent alludes, and many others in this country, manufacture a superior rail. But, all to the contrary notwithstanding, it remains a fact, which the recent exceptional state of affairs has not shaken, that steel is, as a material for rails, superior to iron. The *Engineer* would do well to glance at the history of the steel and iron rail trades, as exhibited in Mr. Swank's reports to the Iron and Steel Association. To the writings of this gentleman we would also refer the conductors of that journal for the future prospects of the iron rail trade, and the field which is likely to be reserved for it.

Some misunderstanding is likely to result from the fact that, in a few instances, iron rails have been bought in Wales for export to this country, at prices slightly higher than those charged for steel rails. The English papers which have called attention to this fact, do not say anything about the quality of the steel rails which can be had cheaper than the iron ones bought; but we presume they were rather poor, while the iron rails are no doubt very good. The real reason, however, for the preference shown for iron in these cases, is that the difference in the duty makes the iron considerably cheaper than the steel to consumers. This may be an anomalous condition of affairs, but it is only temporary, and when the Vulcan Works are in full operation the increased production of steel rails will make short work of the import trade in British iron rails. It is much to be regretted that these works were not started last year.

A great deal of foolish talk has originated in the fact that a goverment contract for certain ironwork, needed for the completion of the new building for the War, State and Navy Departments, has gone begging. That it shows, as some writers are pleased to assume, that by further protecting the iron industry under the tariff the government is working against its own interests, we deny, and we think this conclusion could only be reached by a line of very peculiar reasoning. The shapes wanted by the government are peculiar, and can only be made by a few firms. Just now these firms happen to be extremely busy working on orders, and are unable to do the work wanted by the supervising architect of the Treasury Department. Such a thing has, we believe, never happened before, and is not likely to happen again. The government has always found manufacturers eager to do its work, and usually ready to contract for prompt delivery at prices lower than the work could be done for in the navy yards or other government works. The difficulty at the present moment is that, in view of the advance in prices, every consumer of iron has become an eager purchaser, and the sudden demand has taxed the capacity of the works to an extent which cannot continue. Present works will be enlarged, new works built, or in some other way—possibly by a falling off in the urgent demand—the mills will be relieved. Why a prosperity which is full of benefit to all classes, should be regarded as inviting hostile legislation designed to cripple this industry and force it to meet a competition which would permanently injure the producer, without bringing any permanent—and perhaps no temporary—advantage to the consumer, is a question which could only be answered satisfactorily by those who would rather see the country crippled by free trade than prosperous under a tariff.

We learn from the *Commercial and Financial Chronicle*, that "nearly 20,000 tons "of iron rails have been purchased in New "South Wales for immediate delivery in "the United States." Now this is most alarming. British and Continental competition is bad enough, but if our rail makers have to compete for home orders with those of New South Wales as well, the time cannot be far distant when Macaulay's New Zealander will start on his travels, and instead of doing what that great historian predicted, will probably sit on George's Hill, or High School Hill, as the case may be, and contemplate with interest the ruins which mark the site of Philadelphia or Pittsburgh, according to circumstances. What remarkable changes time brings about—and how sudden-like!

We publish in another column a communication from Mr. Killebrew, the accomplished Commissioner of Agriculture, Statistics and Mines of Tennessee, on the advantages offered by Nashville as a location for blast furnaces. Mr. Killebrew is thoroughly conversant with the numerous details and circumstances affecting the prosperity of iron manufacturing enterprises, and has done much by careful and conscientious work to bring into notice the importance of the mineral resources of the South. His figures of the cost of smelting iron, given in the letter referred to, are startling, but deserve attention, as they come from one whose publications have been free from the grossly exaggerated statements which, unfortunately, have too often characterized the reports emanating from many writers on Southern ironmaking.

The Ponsard Furnace.

(Continued from Sept. 4, page 3.)

From a report made by M. A. Cambresy, of Paris, we take the following account of the treatment of a charge of phosphoric pig, made in his presence at Thy-le-Château by the use of the basic lining and the basic additions of S. G. Thomas:

The dephosphorization of the pig is effected by the reaction produced by the addition and the mixture, at a high temperature, of calcareous highly basic slag, obtained by the previous fusion of a mixture of ground limestone and iron ore, holding 66 per cent. of metal. In conjunction with this mixture, additions are also made of burnt lime or lime mixed with iron ore, during the course of the operation itself. The necessity of these additions is determined by the tests drawn from the bath and cast into small ingot molds.

The refining of the pig, or its conversion into steel, is accomplished by blowing in air. To effect this, after the blast is put on the hearth is turned on its axis by means of a windlass placed at the back of the furnace, and the tuyeres are thus brought to the lowest point, situated on the front of the furnace, diametrically opposite the starting point.

The duration of the blowing depends upon the kind of pig iron operated upon; generally it does not exceed 25 minutes. In order to secure the success of the operation, Mr. Ponsard has divided his treatment into two parts. In the first, which commences when the metal has reached the desired temperature, he makes a first dephosphorizing addition of about two-thirds of the total additions. Then, after complete fusion, he blows in air for about 10 minutes. After that he proceeds to run off the cinder produced, which has already taken up the greater part of the phosphorus in the pig. After removing the cinder he adds the remaining third of the calcareous mixture and, after fusion of the mass, he completes the conversion into steel by blowing in air for only 15 to 20 minutes. Then, the hearth being brought back to its original position, he runs the metal into a previously heated ladle and pours the metal into the ingot molds.

On the 6th of March, 1879, we were invited to be present at trials of the Forno-Convertisseur established at the works of Messrs. Blondiaux & Cie., Thy-le-Château. We report on them as follows:

At 6.50 a. m. the furnace, being previously heated to its normal temperature, was charged with 4000 kilograms of cold Luxembourg pig iron and 500 kilograms of old rails. At 9.5 the charge was melted.

It is scarcely necessary to remark that, in the ordinary working of the Forno-Convertisseur, it will suit better to make the charge hot; that is to say, to introduce the metal in a molten state, in order to save precious time. Forty to 45 minutes should then be sufficient to heat it to the point where the operation really commences in the Forno-Convertisseur. This hot and rapid charging can be easily effected by a special cupola, which does not form a part of the experimental plant at the works of Thy-le-Château.

Then the first addition, composed of 200 kilograms of limestone (corresponding to about 100 kilograms of lime) and 120 kilograms of iron ore (66 per cent. metallic iron), was introduced on the hearth. After these materials were melted, a sample of the cinder was drawn, and then a mixture of 33 kilograms of lime and 66 kilograms of iron ore were added. After a second examination of the cinder, a mixture of 17 kilograms of lime and 33 kilograms of iron ore were again added. Finally, after a third examination of the cinder, a fourth addition of 50 kilograms of lime and 25 kilograms of iron ore was made. Up to that time, therefore, there had been added 544 kilograms of material, consisting of 300 kilograms of lime and 244 kilograms of iron ore.

The repeated trials which we have just mentioned would evidently not occur in the continuous operation of the process, treating always the same material. In experiments these repeated trials are unavoidable, for, as will be easily understood, each particular kind of pig iron requires additions in special proportions, which can scarcely be determined excepting by practice.

The bath being well melted, the blast was applied and the hearth was given half a turn, so as to bring the tuyeres under the level of the bath. The first application of the blast lasted for 10 minutes. The pressure gauge of the blowing engine (that of the blast furnace of the works) marked a pressure of 280 grams. After 10 minutes the hearth was turned back to its original position and the blast was stopped. A few moments were allowed the mass, so violently agitated by the blast, to settle on the hearth in the order of density, and then the floating cinder was run off. A final addition, composed of a mixture of 100 kilograms of basic cinder and 50 kilograms of burnt lime, was made. These materials being completely melted, the blast was again applied, the hearth put in motion and brought round to the same position as during the first blow. This second blow lasted 16 minutes, during which time various tests of the bath were examined. At the end of that time the hearth was brought back to its first position and the blast stopped. After some time of rest, 70 kilograms of ferromanganese were added and the metal was run into a ladle previously heated for that purpose. It was then 12.5 p. m.

From the facts which have just been stated, it follows:

1. That the total additions amounted to 694 kilograms of material, which includes of 413 kilograms of lime and 344 kilograms of iron ore. These additions were designed for the dephosphorization of the metal.

2. That the total duration of the blow proper was 26 minutes.

3. That the total duration of the operation was from 8.30 a. m. (when the metal was properly heated) till 12.15 p. m., say three hours 45 minutes for the charge given. We should observe that this time will be considerably reduced in ordinary continuous working, in works conveniently fitted up with the view of operating only the Ponsard process, and giving all the convenience and facilities which can scarcely be expected in an experimental outfit. We estimate the time necessary for ordinary treatment of a charge with the Ponsard Forno-Convertisseur, properly fitted up, at three hours 15 minutes.

Production.—In order to form an estimate of the production possible with a Ponsard apparatus, it may be well to state that the loss in the operation, that is to say, by mechanical action, oxidation during the reaction and the blowing period, and the elimination of the impurities contained in the pig iron, may be put down at 15 per cent. of the initial charge. Although the trials of the process have been made with a charge of 4500 kilograms, it is evident that the charge may, without any practical inconvenience, be increased to 6000 kilograms.

The production of Ponsard steel by an operation will therefore be 5100 kilograms, say, in round figures, 5000 kilograms.

The duration of an operation in ordinary working may be estimated as follows:

	Minutes.
Charging molten pig iron	10
Reheating the metal charged	45
First addition and fusion of cinder (reaction.)	15
First blast	15
Running off the first cinder	15
Second addition of cinder, fusion and reaction	15
Second blast	25
Settling, addition of ferromanganese	10
Casting	15
Cleaning the furnace, stopping up, &c	30
Total	195

Say 3 hours 15 minutes, to which it may be well to add for contingencies and extraordinary repairs 10 minutes per operation. Three hours 25 minutes may, therefore, be counted on as the ordinary duration—say 7 operations in the 24 hours.

The production of one apparatus will, therefore, be 35 tons of ingot steel. Say for a year of 300 effective working days, 10,500 tons of refined metal.

Net Cost.—We will distinguish, in estimating the net cost of manufacturing, the three ordinary elements in the account, viz.: Materials, labor and general charges.

	Francs.
Materials—Pig iron charged per apparatus per day (counting for convenience sake the scrap accumulated from the waste of the rolling mills at the same price as the pig itself), 42,000 kilos. at 48 francs per ton; a slightly higher rate than the actual, say	2016.00
Cinder—For addition, composed of 50 per cent. lime and 50 per cent. iron ore, assuming the theoretical figure of 8 (eight) times the quantity of phosphorus in the charge (say 18 thousandths), we arrive at a consumption of 6048 kilos of cinder, composed of 3024 kilos. of lime, or 6048 kilos. of limestone, at 5 francs per ton, say 30.25, and 3024 kilos. of ore, at 15 francs per ton, say 45.36, making together	75.61
Ferromanganese—About 700 kilos. per day, at 300 francs per ton	210.00
Fuel.—1. Melting the charge in a cupola, including all labor complete, estimated at 5 francs per ton	210.00
2. Supply of the Forno-Convertisseur, fed by a gas-producer, consuming 250 kilos. of coal per hour, say 6000 kilos per day, at the rate of 18 francs per ton	108.00
3. Fuel for the blowing engines, stoves and heating the ladle, estimated at 5 tons per day, at 18 francs per ton	90.00
Labor.—Complete staff of a furnace, consisting of 2 foremen at 6 francs per day and 10 workmen at 5 francs per day, say per gang 62 francs, and per day	124.00
General Charges.—1. Wear and tear, maintenance of the furnace, hearth and vault, lime bricks, repairs to tools and petty expenses, estimated	125.00
2. Cost of direction, salaries, sinking fund, office and traveling expenses, &c., at the rate of 1 franc per ton produced, say per furnace per day	35.00
Together	2993.60
Contingencies	26.39
Total	3020.00

Say per ton of steel in the rough:

$$\frac{3020}{35} = 86 \text{ francs } 30 \text{ centimes.}$$

It will be noticed that the cost of making ingot steel by the Forno-Convertisseur is practically the same as that by the Bessemer, and considerably less than by the Martin-Siemens, process. This fact is easily explained.

In the Bessemer process the waste of the pig iron by the blowing is much greater, because the temperature must be raised by the combustion of the elements of the metal itself. Besides, the cost of constructing the apparatus being considerably greater, the general expenses are thereby increased, and these differences offset the small expense relatively speaking, of the dephosphorizing additions in the Ponsard process.

In the Martin-Siemens process the expenses are very considerably greater than in the Ponsard process, because, on the one hand, the decarburation is effected by means of additions of metallic iron, which costs more than the pig iron treated; and, on the other hand, in the conversion into steel, which takes place by reaction, the operations are very much more lengthy and the fixed daily expenses are distributed over a much smaller output.

In any case the Ponsard process presents over the other two systems with which we have compared it, the indisputable advantage of using a more abundant and much less costly raw material, the difference in the cost of which is clear gain to it.

In order to show more clearly the benefits to be derived from the Ponsard process, we will follow the manufacture up to the marketable product; that is to say, we will add to the net cost which we have just calculated, the expense of converting the rough ingot steel into rails, small beams, angles, plates, &c. These expenses are the same for the metals produced by the other systems now in use, and for the steel produced by the Ponsard system. We may count them, on an average, per ton of rails, small beams, angles, &c.; that is to say, per ton of shaped steel bars (waste included), 30 francs, and per ton of heavy plate (waste included), 45 francs. We can, therefore, allow as the cost of production by the Ponsard system: For steel rails, per ton, 117 francs; for heavy steel plate, per ton, 132 francs.

Mr. Ponsard has completed the plans and estimates for an establishment for the application of his process by means of four Forno-Convertisseurs, of which three will be running constantly, together with rolling mills intended to convert the whole output of steel into marketable articles, such as shaped bars, plates, &c.

From the data previously stated, we have seen that the annual out-turn of one apparatus will be 10,500 tons of ingot steel; say for the three apparatus together, a total annual production of 31,500 tons of ingot steel, producing, after taking account of the scraps or waste, which is again submitted to treatment:

17,500 tons of steel rails, at a net cost of 113 francs.
8,077 tons of steel plates, at a net cost of 128 francs.

25,577 tons altogether.

Taking into account a considerable reduction in the selling price, a reduction which it is necessary to provide against on account of sacrifices to be made in order to have the new Ponsard steel adopted in practical industry, it is shown from the considerations which we have stated, that, without fear of miscalculation, a net profit of 20 francs per ton of Ponsard steel rails may be counted on, and a net profit of 40 francs per ton of steel plates. Under these restricted conditions the manufacture, as we have stated, will give an annual profit of:

	Francs.
Steel rails	17,5000 x 20 = 350,000
Steel plates	8077 x 40 = 323,080
Together	673,080

The examination which we have made of the Ponsard system leads us to mention specially our appreciation on the following points, viz.:

Dephosphorization.—The dephosphorization of the pig iron submitted to the treatment is a fact beyond dispute, as shown in the analyses, of which we have given the results in our report.

This point is an extremely important one, either from a scientific or industrial point of view. It secures to the Ponsard process a general application and unusual profits by the production of a metal in much demand, from a raw material presenting considerable economy over that at present employed. This phenomenon, so much desired up to this time, finds its explanation in the nature of the purifying additions themselves, and the high temperature at which the reactions are effected; in fact, not only is the temperature maintained at the minimum of the melting of steel, as in the Martin-Siemens furnace, but, in addition, by blowing in air for decarburation, the combustion of silicon, &c., raises the temperature still further, similar to the phenomena which occur in the Bessemer process. No doubt can exist as regards this.

Apparatus.—The Ponsard apparatus, especially its central part—the inclined and movable hearth—which constitutes the new element of his invention, is easily managed. In practice, it presents by its arrangement all the elements necessary for modifying the working according to the special conditions presented in working raw materials of different kinds. In this respect, it may be asserted that its introduction into industry will not present any difficulty which cannot be quickly overcome, and continuous application will ensure a constantly increasing certainty in the results. In a word, it is a practical apparatus.

Cost.—If we should compare the Ponsard process with the Bessemer and Martin-Siemens processes, presuming that they all treat the same pig iron, we would find in the Ponsard furnace great advantages over the others. In fact, as compared with the Bessemer converter, the Ponsard apparatus presents the advantage of a much less expensive plant. Besides, the operation is most easily managed, because the apparatus presents facilities for correction or for modification of the composition of the bath, which the Bessemer apparatus does not permit of in the course of converting. In the same way, the Ponsard apparatus has over the Martin Siemens furnaces the advantage of great rapidity of work, which diminishes the net cost of the products considerably.

These are, briefly, the results of M. Cambresy's investigations, which, we may add, were made by him for a company that has bought the patent rights for France, and is now erecting four furnaces and a complete plant at Creil, near Paris. The chief items which go to make up the cost of the process are given in his estimate printed above, which may be easily adapted to circumstances here.

Death of an Inventor.—Mr. William H. Howard died on Sunday, at his home, Media, Delaware County, aged 82 years. Deceased was an inventor. Born in Ware, Mass., at the time when American manufactures were just expanding from the relief from British laws, under difficulties that were met but overcome by Whitney, Fulton and Bigelow, with a mind as inventive and skill as great, he has contributed largely to the present supremacy of American machinery. In Worcester he was the inventor of the wire machinery that, in the hands of Mr. Washburne, his partner, was carried to its present grand consummation. His favorite saying was that machinery can be invented to perform whatever the hands can execute. Machinery for him regulated manifold motions in looms, drew wire and lead pipe, sorted type and braided straw. His rank as a woolen manufacturer, engineer, and, in late years, as a magistrate, will be strongly remembered in Philadelphia, Worcester and Media as a leading genius in his line. His friends seemed limited only by the number of his acquaintances. His funeral will take place at Media on Thursday. The remains will be interred in Woodlands Cemetery.

In considering the prospect of a heavy gold movement to this country, the present plethoric condition of reserves of the great European banks is a most important factor. According to the last published statements, the Bank of England held £35,368,000, against £21,780,000 a year ago; the Bank of France, £89,032,000, against £86,667,000; the Bank of Germany, £27,524,000, against £18,534,000; and the smaller European banks, £37,992,000, against £32,002,000—making a total of £189,936,000, against £165,983,000. Europe could, therefore, spare us $120,000,000 of specie, and still the foreign reserves would be depleted no lower than they were at this time a year ago. In view of these facts there would seem to be no possibility this fall of a really tight money market.

The Relation of Iron and Nail Values.

We are indebted to Messrs. W. B. Belknap & Co. for a copy of the following table, compiled by Mr. H. Justi, Jr., showing the relation between the average prices of iron and nails during ten years ended with August ult.:

Months.	1869. Iron.	1869. Nails.	1870. Iron.	1870. Nails.	1871. Iron.	1871. Nails.	1872. Iron.	1872. Nails.	1873. Iron.	1873. Nails.	1874. Iron.	1874. Nails.	1875. Iron.	1875. Nails.	1876. Iron.	1876. Nails.	1877. Iron.	1877. Nails.	1878. Iron.	1878. Nails.	1879. Iron.	1879. Nails.
January	....	....	$4.00	$4.40	$3.50	$4.35	$3.70	$4.50	$3.70	$5.40	$3.70	$4.10	$3.60	$3.85	$3.20	$3.75	$2.95	$3.85	$1.85	$2.50	$1.80	$2.00
February	....	....	4.00	4.45	3.50	4.35	3.70	4.50	3.70	5.40	3.70	4.10	3.60	3.85	3.20	3.75	2.95	3.85	1.85	2.50	1.80	2.00
March	....	....	4.00	4.45	3.50	4.35	3.70	4.50	3.70	5.40	3.70	4.10	3.60	3.85	3.20	3.75	2.95	3.85	1.85	2.50	1.80	2.00
April	....	....	3.75	4.40	3.50	4.35	3.70	4.50	3.70	5.40	3.70	4.10	3.60	3.85	3.20	3.75	2.95	3.85	1.85	2.50	1.80	2.00
May	....	....	3.75	4.40	3.50	4.35	3.70	4.50	3.70	5.40	3.70	4.10	3.60	3.85	3.20	3.75	2.95	3.85	1.85	2.50	1.80	2.00
June	....	....	3.75	4.00	3.50	4.35	3.70	4.50	3.70	5.40	3.70	4.10	3.60	3.85	3.20	3.75	2.95	3.85	1.85	2.50	1.80	2.00
July	....	....	3.75	4.00	3.50	4.35	3.70	4.50	3.70	5.40	3.70	4.10	3.60	3.85	3.20	3.75	2.95	3.85	1.85	2.50	1.80	2.00
August	$3.75	$4.40	3.50	4.10	3.50	4.35	3.70	4.50	3.70	5.40	3.70	4.10	3.60	3.85	3.20	3.75	2.95	3.85	1.85	2.50	1.80	2.00
September	3.75	4.50	3.50	4.10	3.50	4.35	3.70	4.50	3.70	5.40	3.70	4.10	3.60	3.85	3.20	3.75	2.95	3.85	1.85	2.50	1.80	2.00
October	3.75	4.50	3.50	4.10	3.50	4.35	3.70	4.50	3.70	5.40	3.70	4.10	3.60	3.85	3.20	3.75	2.95	3.85	1.85	2.50	1.80	2.00
November	4.00	4.40	3.50	4.10	3.50	4.35	3.70	4.50	3.70	5.40	3.70	4.10	3.60	3.85	3.20	3.75	2.95	3.85	1.85	2.50	1.80	2.00
December	4.00	4.50	3.50	4.10	3.50	4.35	3.70	4.50	3.70	5.40	3.70	4.10	3.60	3.85	3.20	3.75	2.95	3.85	1.85	2.50	1.80	2.00

Deadlock in Live Cattle Exports.—Depression in the English market, together with hostile legislation and high rates of marine insurance, all serve to check exports of live cattle. Exporters manifest a discouragement in strong contrast with the buoyancy prevailing a month or six weeks ago, when the business was "booming." At present they have no motive to do anything; in fact, they claim to have lost money on their latest ventures. Throughout the United Kingdom the laws against cattle from the United States are rigorously enforced, no animals being permitted to leave the landings alive, while Canadian cattle can go anywhere, giving local butchers the privilege of killing when they choose. At Belfast trouble is made about the sale of manure from the cattle yards, the admission of this article being pronounced as dangerous as it would be to disperse the animals without restriction. Rates of marine insurance are much higher than a year ago, and on the 15th inst. they will be advanced again, in anticipation of the equinoctial gales.

Sale of the Keystone Furnace.

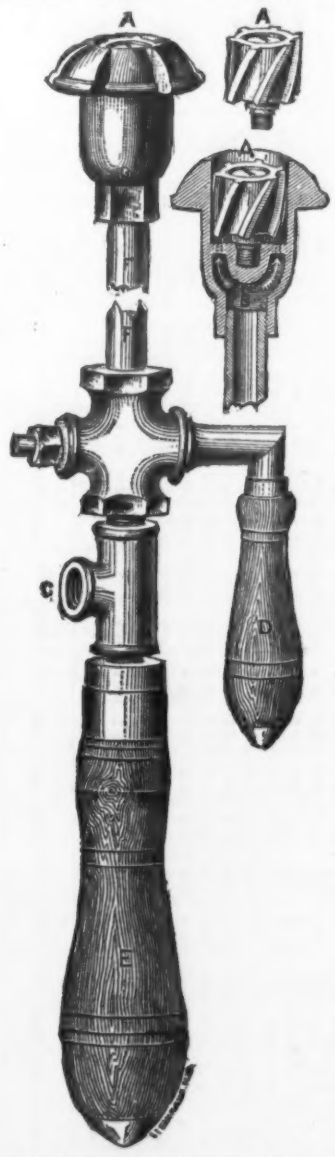
EASTON, PA., Sept. 8.—The Keystone Furnace, at Chain Dam, has been sold by Henry Fulmer to Messrs. Daniel Runkle, John T. Knight, Samuel Thomas and John B. Hendry, well-known iron men, for $120,000. Mr. Fulmer bought the furnace at sheriff's sale two years ago for $60,000. In the present sale Mr. Fulmer reserves an iron mine valued at $50,000. It is believed that the purchase is in the interest of the Thomas Iron Company.

Mr. Abraham S. Hewitt last evening, when speaking of the restarting of the Ringwood Furnace, which has been idle since 1872, mentioned incidentally a remarkable achievement. He said the Durham Furnace has been making 450 tons of iron per week for a month past, on a consumption of 1¼ tons of coal per ton of cast iron, the yield of the ore being 52 per cent. This, so far as he remembered, is the largest product of iron made with anthracite of which there is any record. When questioned in regard to the outlook for the iron interest, Mr. Hewitt promptly replied that it was "good, decidedly so; we are on a solid gold basis, and as long as we stay there we are all right." Our reporter suggested that the effect on exports might prove unfavorable, especially this advance in the price of iron. "Yes," said Mr. Hewitt, "of course the advance must operate to check the export trade and may help the English people to unload their accumulated stock; we must not advance too fast nor too far. But, all these things," he added, "regulate themselves by natural laws. For example, we did not see how England could pay for all her grain, but there is no difficulty about it and all comes out right."

New Steam Boiler Tube Cleaner.

William Cooke, successor to Cooke & Beggs, of this city, is introducing a novel steam boiler-tube cleaner, of which the accompanying cut is an illustration. In the hollow casting B, slotted to allow the passage of air, is placed the wheel A, which is provided with helical ribs. F is a hollow tube connected to a T-coupling by a small stop-cock, and D and E are wooden handles. Steam is admitted to this apparatus by means of a flexible tube connected with the T-coupling C on one end, and with, say, the top gauge-cock on the other.

The rose-head having been introduced in the tube to be cleaned, the cock D is opened, the steam impinges on the ribs of the wheel A, causes the wheel to revolve rapidly and enters the tube in swift helical currents, which are further accelerated by the air



drawn in through the air spaces in B. The sediments are collected and carried through the entire length of the tube, as the cleaner gradually advances, until they are finally ejected at the further end. When the apparatus is removed to another tube the stop-cock is temporarily closed.

The advantages claimed for this boiler-tube cleaner are that, in a given time, it will perform eight or ten times as much work as the ordinary brush or scraper, and that, by its use, the operation is freed from the dirt which has hitherto attended it, the soot being thoroughly moistened by the steam. It is stated that 15 to 20 minutes are sufficient time to clean a boiler with about 100 tubes; and the inventor claims that by a daily use of this apparatus a saving of 10 to 20 per cent. of the fuel may be effected.

The Cincinnati Exhibition.—The Cincinnati Exposition buildings are now completed and the exhibitors nearly all in their places, this being the only season in the history of Cincinnati expositions when exhibitors have been in with their goods by the time specified. For this a great deal is due to the present management. The power for the machinery in Power Hall is furnished by one of the engines of C. H. Brown & Co., of Fitchburg, Mass., driving two heavy lines of shafting with many large pulleys. The belt was furnished by E. F. Bradford & Co., of Cincinnati. It is 82 feet in length (double) by 24 inches in width, and is made from their best quality oak-tanned leather. It drives both lines of shafting in Power Hall, and seems to be entirely equal to its heavy task. The Lane & Bodley Company also have one of their stationary engines on exhibition and doing duty in Machinery Hall. All the space in the building was taken some time before the expiration of the time during which applications would be received, and many manufacturers have been left without space because tardy in making application. A large number of manufacturing cities and towns of the West are represented by full and handsomely displayed exhibits of their industrial products.

Casting in Bronze.—On the afternoon of September 5 a number of people assembled, by invitation, at the foundry of Bureau Bros. & Heaton, Philadelphia, to witness the casting of a portion of the bronze equestrian statue of Major General George H. Thomas. The statue which, it is claimed, will be one of the finest pieces of bronze work ever executed in this country, is to be erected in Washington, under the auspices of the Society of the Army of the Cumberland, and is so near completion as to make its unveiling possible at the time appointed, November 12. It will be 15 feet in hight, stand upon a granite pedestal 19 feet high, weigh between 6000 and 7000 pounds, and cost about $40,000. It was modeled by J. Q. A. Ward, of New York. The figure of General Thomas is completed, the portion just cast being the shoulders and neck of the horse, the head of the animal forming a separate casting. The attitude of the General is calm, dignified and natural. In the bared left hand are held the reins, and in the gloved right hand the hat and other glove, the arm being extended straight down by the side. The uncovered head is massive, strong and manly, the gaze seeming intently fixed upon some distant point, as upon the movements of troops in battle. The head is lifted slightly, showing finely the broad, solid forehead, the deep-set eyes and the short, curling beard. The thick but not corpulent body is clearly indicated under the closely-buttoned military coat, and the legs extend somewhat forward to accommodate themselves to the sudden cessation of the horse's motion. All four of the horse's feet rest upon the ground, three of them firmly, while the left hind foot rests only upon the toe. The lifted head and ears, the open mouth and eyes, and the mane and tail stirred by the wind, are indications of excitement in rest.

Proposals for Plows, Agricultural Machinery and Hardware.—The Commissioner of Indian Affairs, Nos. 65 and 67 Wooster street, city, will, until September 15, receive sealed proposals for the following articles for the Indian service: Plows, breaking, with rolling coulter and cutter wheel, 12-inch, 233; 14-inch, 50; 16-inch, 20; stirring, 12-inch, 130; 10 inch, 280; 9-inch, 105; 8-inch, 40; double-shovel, 342; crossing, 9-inch, 263; harrows, 40-tooth, 604; harrow-teeth, 1¼-pound, 3260 pounds. Machines—Threshing, 5; mowing, 12; reaping, 14; mowing and reaping combined, 13; fanning mills, 5; separators, 2; seed-drills, 24; cultivators, 4; seeders, 9; corn-shellers, 2; corn-planters, riding, 1; hand, 45; sod, 12; rakes, hay, sulky, 17; hand, 12 dozen; garden, steel, 83 1-3 dozen; shovels, long-handled, 42 dozen; short-handled D, 24 dozen; scoop, ½ dozen; spades, 60 dozen; hoes and handles, 106 dozen; irrigating, 1 dozen; grub, 42 dozen; scythes and snaths, 9 dozen; scythe-stones, 18 dozen; chains, log, with hooks and swivel, ½-inch, 6; 5-16-inch, 6; ⅜-inch, 22; ox, ¾-inch, 146; yokes and bows, ox, 355 and 12 small; keys, bow, ox, 20 pairs; forks, manure, 6-tine, 2 dozen; hay, 3-tine, 45 dozen; hay, 4-tine, 5 dozen; wrenches, monkey, 6 dozen; hooks, potato, 6 dozen; harness, double, plow, with back band, 31 sets; wagon, with breeching, 194 sets; wagon, without breeching, 100; collars, horse, 17-inch, 1 dozen; 22-inch, ⅙ dozen; crow-bars, 100; wagons, wide track, 3¼-inch, with box, top box, spring seat, brake, and extra set single and double trees, 449; double trees for plowing, 200; axes and handles, 1000; pick, with handles, 424; augers, assorted, 12 dozen; knives, drawing, 7 dozen; saws, buck, 4 dozen; rip, 4 dozen.

Special Notices.

PARK BENJAMIN'S

SCIENTIFIC EXPERT OFFICE,

37 Park Row, New York.

Examines and reports on the novelty of inventions.
Furnishes recipes and information on all industrial processes.
Prepares drawings and engravings of machinery.
Tests, designs, constructs and selects machinery.
Address,

G. H. BENJAMIN,
Business Manager.

Corporation of Nottingham, England, Gas Department.

Exhibition of Gas Engines, Cooking Stoves, Burners and other Apparatus.

The Gas Committee of the Corporation of Nottingham intend holding, from the 24th to the 29th of November next, an exhibition of all kinds of apparatus or appliances, showing the advantages and economical uses of gas for engines, cooking, domestic and other purposes. They will provide space, gas and connections free, and give prizes, consisting of medals and certificates of merit.

Intending exhibitors will be furnished with printed conditions, forms for allotment of space, and any further information, on application to the undersigned. JOHN WILSON.
General Manager and Secretary to the Exhibition Committee.
Gas Offices, George Street, 18th August, 1879.

Special Notice.

Hardware Manufacturers' Exchange,

43 Chambers Street, New York.

The undersigned desires to inform all Manufacturers of Hardware throughout the United States that he has fitted up rooms, centrally located, well lighted, &c., running through from Chambers to Reade street, for the exhibition of manufactured goods in all lines of hardware. Any manufacturer can at a small annual cost exhibit his wares to actual buyers throughout the year, and all visitors can examine them free.

The advantages to both manufacturers and buyers are too apparent to need any explanation.

For further particulars and application for space address

W. G. FULTON, Manager.

RICHARDS & DOLE,

Springfield, Mass., U. S. A.

DESIGNERS, DRAUGHTSMEN & BUILDERS of MACHINERY,

May be Consulted upon Matters Relating to

MECHANICAL ENGINEERING

AND MANUFACTURES. Special attention given to the development of inventions and improvements. Model, Pattern and Machine Work in general.

WANTED—The exclusive services of an engineer, or otherwise, of sterling integrity, energy and sobriety, who has large experience in the construction and management of coke furnaces. Undoubted references required.
Address P. O. Box 32, Philadelphia, Pa.

HARDWARE STORE FOR SALE,

In Dover, N. H., to Close an Estate.

The old established Hardware Store of G. F. Rollins & Co., with a well-selected stock of $8000 to $9000, and a good run of custom.

WM. H. ROLLINS,
Administrator.
Dover, N. H., Sept. 4, 1879.

Special Notices.

A Woodruff & Beach Beam Engine,

Low pressure, 42-inch cylinder, 84 inch stroke, with fly-wheel pulley 20 feet diameter, 36 inch face, and

Four Tubular Boilers,

60 inches in diameter, 20 feet long, and all connections practically as good as new.
For sale by

The Geo. Place Machinery Agency,
121 Chambers and 103 Reade St.,
NEW YORK.

WE QUOTE FOR

Steel or Iron Rails, Steel Ties, Axles, Forgings, Bars, Plates, Nail Sheets Billets,

and all Steel goods, f. o. b. any British port, or c. i. f. any United States port. Thirty years' experience in the Steel Trade.

NIXON BROTHERS,
Newcastle-on-Tyne, ENGLAND.

Founder.

Wanted, an Assistant Founder or Night Boss in a Charcoal Furnace. Permanent situation and good pay to a steady, competent man. Address

"CHARCOAL,"
Office of *The Iron Age*, 83 Reade St., New York.

FOR SALE.

A valuable property in the State of Wisconsin, free from all incumbrances, embracing an inexhaustible deposit of Iron Ore and about 900 acres of land, of which about 700 acres are covered with a heavy growth of large oaks and other hardwood timber. The ore is rich and free from even a trace of phosphorus. The facilities are unusually favorable for the manufacture of a superior quality of Charcoal Iron, and as cheap, if not cheaper, than can be manufactured elsewhere in the United States.

It is on the line of one of the leading railroads of the State, and is accessible to all Mississippi ports and the lakes.

The veins or mines are to a certain extent developed, and had been successfully worked for some time.

The greater part of the land would be well fitted for farming purposes, as the ground is very fertile, and the price asked for it will not exceed that asked for common farming land. Property in New York City or vicinity will be taken in exchange.

For information apply to or address the proprietor,

JULIUS W. HAAS,
Dubuque, Iowa.

Or EDWARD MULLER,
Care Bigelow & Co.,
P. O. Box 135, Newark, N. J.

FOR SALE OR LEASE,

A MANUFACTURING ESTABLISHMENT
IN SCRANTON, PA.

On corner of two main streets, only one-quarter mile on level road from two railway stations. Size of lot 50 by 150 feet; main building, 30 by 100 feet; engine, 35-horse power. Buildings and machinery first-class and nearly new.

Underlaid and surrounded with coal, the cost of fuel for steam is merely nominal. Best forge coal $1.50 per ton. With complete lines of shafting, &c., the premises can be easily and cheaply adapted to any light manufacturing business.

Former proprietor, after successfully manufacturing Axes and Edge Tools in the vicinity for 30 years, designed and built this shop at an expense of $10,000 for the continuance of the business, but failed during the late depression.

Having neither time nor ability to run these works, I will sell very low on easy terms.
Address,

AMBROSE MULLEY,
Providence, Lackawanna County, Pa.

AUSTRALIA.

The undersigned would take charge of a few exhibits at the Melbourne Exhibition. Best New York references.

Address,

THOMAS G. LESLIE,
P. O. Box 102, Melbourne.

Valve Refitting Machines.

All users of Globe Valves should have one.
Send for circular and price list.
A few good agents wanted to sell on commission.

GRISCOM & CO.,
Pottsville, Pa.

FOR SALE.

Hardware Stock and Fixtures in one of the best towns in Nebraska. Will be sold low for satisfactory reasons. About $2500 required. A splendid chance.

Address,

HARDWARE,
Box 21, Lincoln, Neb.

FOR SALE.

Rail or Bar Train complete, with rolls for rolling rails from 12 to 65 lbs., and also for all sizes of bar iron, flats, rounds and squares, in perfect condition, having been in use for a short time only.

For terms, &c., apply to

J. M. BROWNSON,
P. O. Box 748, Pittsburgh, Pa.

WANTED.

Situation as Salesman, Business Manager or correspondent, by a gentleman who has been connected with a large rolling mill for many years, and has an extensive acquaintence with the merchants and consumers of iron throughout the country. Address,

SALESMAN,
Office of *The Iron Age*, 77 4th ave., Pittsburgh, Pa.

For Sale,

One Iron Planer to plane five feet square and ten feet long. Cross and angle feed. Cross head moved up and down by power. Machine in excellent condition. Address

GEO. PLACE, Agt.,
121 Chambers St., New York.

SITUATION WANTED as General or Assistant Manager, by a man of long experience in Rolling Mill and Nail Business. Best references for character and ability. Address MANAGER,
Office of *The Iron Age*, 83 Reade Street, N. Y.

JUST PUBLISHED—SENT FREE.

Complete History of Wall Street Finance, containing valuable information for investors. Address Baxter & Co., Publishers, 17 Wall street, New York.

Special Notices.

Bessemer Steel Wire Rods,

in lengths averaging sixty pounds, guaranteed to draw at least to No. 9 without annealing and to draw to No. 24.

For sale by

E. S. WHEELER & CO.,

54 Cliff Street,

NEW YORK.

JOHN E. SWAN & BROTHERS,

GLASGOW, SCOTLAND,

Exporters of all brands of

Scotch & English Pig Iron.

See advice from London.

Old Iron Rails, Coals and Minerals.

TRUSTEE'S SALE OF

TENNESSEE IRON & STEEL WORKS,

CHATTANOOGA, TENN.

By virtue of the authority and power vested in me by a deed in trust, executed on the 17th day of June, 1879, by the Tennessee Iron and Steel Company, to me as Trustee, and registered in the Register's Office of Hamilton County, Tennessee, in Book "G," volume 2, pages 306 to 315, I will on

Thursday, the 25th day of September, 1879,

in front of the Court-House door, in the city of Chattanooga, Hamilton County, Tennessee, expose to sale and sell at public outcry, to the highest bidder, the following described property, to wit:

The Works of the Tennessee Iron and Steel Company, consisting of one 8 in. and one 18 in. train of Rolls for making all sizes of merchant iron, together with Furnaces, Tools, Buildings, Land upon which the Works stand. For more full description, of which reference is made to said deed of assignment, and which will be exhibited on the day of sale, as will, also, the terms of sale be made known at the time said sale is made. S. M. WINCHESTER, Trustee,
This 22d day of Aug., 1879. Chattanooga, Tenn.

TO MANUFACTURERS AND CAPITALISTS.

FLOWER PINS.

PATENT FOR SALE.

Address

J. H. PLUMMER,
1276 Pacific Street, Brooklyn, N. Y.

Blast Furnace for Sale or to Lease.

Situated on the Hudson. Size, 16x60, with first-class blowing machinery, ovens, tools, &c. The location for transportation of stock to the Furnace and iron to the market is most excellent. There is a fine dock and good appliances for handling material. Iron can be made here very low, and at present prices at a good profit.

PANCOAST & TARR,
28 Platt St., New York.

BOOKKEEPER AND ACCOUNTANT.—A young man, age 28, a thoroughly competent and reliable bookkeeper, accountant and correspondent, familiar with all details of office work, domestic and foreign accounts, exchange, &c., desires to make an engagement for September 15th. During a period of five years with one house, the advertiser has acquired a valuable and varied experience, qualifying him in every respect for a position of trust and responsibility.
Address, MODERATE EXPECTATIONS,
Office of *The Iron Age*, 83 Reade St., New York.

A Party Starting a Small Rolling Mill

For the manufacture of small sizes of iron, wishes to find a practical man that fully understands the business and can furnish some capital to make him interested. Such a person will find it a safe and profitable investment.
Address,

ROLLING MILL,
Box 1749,
New York Post Office.

To Manufacturers of Iron for Steel Purposes.

DUPUY'S DIRECT PROCESS

Produces bars direct from ore, in one heat, at low cost, in ordinary Reverberatory Furnaces. It is indorsed by steel manufacturers to be equal to best Swedes iron for high grades of steel.
For information apply to

P. S. JUSTICE,
No. 14 North Fifth Street, Philadelphia.

A PRACTICAL IRON MANUFACTURER AND owner of a Rolling Mill, 8 Puddling and Heating Furnaces, 2 Trains of Rolls, and all appliances; ready for immediate business; location not excelled in Eastern Pennsylvania; will sell, form a limited partnership, or take a partner on favorable terms. For particulars address C. E. W., Office of *The Iron Age*, 220 S. 4th st., Philadelphia.

WANTED—A SITUATION IN A HARDware Manufacturing or Jobbing House by a young man of 12 years' experience, at either office or outside work. Can give satisfactory references. Or would represent some out-of-town manufacturer to sell goods to the trade in New York and vicinity. Address J.,
Office of *The Iron Age*, 83 Reade St., New York.

FOR SALE OR RENT.—The Pequest furnace and 200 acres of ore and limestone; land can be sold or leased at a reasonable price.
Address E. DALLETT HEMPHILL,
Lock Box 26, Allentown, Pa.

WANTED,—A SITUATION AS SUPERINtendent or manager, by a practical man who thoroughly understands the manufacture of iron in all its details, including merchant bar, hoops, sheets, plate and tank iron, &c. Satisfactory references. Address "IRON,"
Office of *The Iron Age*, 83 Reade St., N. Y.

WANTED.—Situation as salesman for a Pig Iron dealer or manufacturer in one of the Eastern or Middle States. Satisfactory references given. Address, PIG IRON,
Office of *The Iron Age*, 220 South Fourth St., Phila., Pa.

FOR SALE—About 70 tons Horse Railroad track; has been used but little. Also 2 cars for one or two horses, nearly new. Parties in want of the above described articles, will find it to their interest before purchasing to inquire of
ANSEL HURLBUT, New Haven, Ct.

Special Notices.

One 9-inch Train Rolls,
One 16-inch Train Rolls,
Both with Housings.
One Steam Hammer,
One Pair Shears,
One Lot Steel Ingot Molds,
Three Large Woodward Steam Pumps,
Three Small Steam Pumps,
Two Hoisting Engines,
Three Steam Boilers,
One Lighthall Condenser,
One Surface Condenser,
Deck Pumps, Low Pressure Gauges, Registering Gauges, &c.

FOR SALE LOW BY

DANIEL W. RICHARDS & CO.,

Dealers in

Scrap Iron & Metals,

88 to 96 Mangin St., New York.

Price Fifty Cents.
JUST ISSUED.
SECOND EDITION OF
LEIGH'S
Discount Book,

with a Guide Page added, by which any desired table can be referred to *instantly, without turning a leaf* or *wasting a moment.*

This edition is handsomely bound in cloth, and will be mailed to any address upon receipt of the price, 50 cents.

Bound in leather, with silicate leaves, price $1.
Address **EDWARD B. LEIGH,**
St. Louis Elevator, St. Louis, Mo.

Or either of the Publishers, viz:
IVISON, BLAKEMAN, TAYLOR & CO., New York.
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Counting House Edition (former price, $3), size, 9x11 inches, Cloth Bound, large type, $2.

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Or 239 Front St., New York.

JOHN R. WHITLEY & CO.,

European Representatives of First-Class American Houses,

WITH

FIRST-CLASS AGENTS

IN THE

Principal Industrial and Agricultural Cities and Centers of Europe.

TERMS ON APPLICATION.

LONDON, 7 Poultry, E. C.
PARIS, 8 Place Vendome.

The Sherman Process Co.

9 Pemberton Square, Boston, Mass.,

Issue Licenses to use the Process for the Manufacture of Iron and Steel

In the Bessemer Converter, Crucible, Siemens-Martin, Puddling, Blast and Cupola Furnaces.

The use of this Process improves the quality of the product, saves fuel and labor, and does not require any change in furnace or manner of working
See page 17 of *The Iron Age* of Oct. 25th, 1877.

Price Books.

Large Size, Full Leather		$12.00
" "	Half "	10.00
Pocket "	Full "	5.00

Send for circular.

BUELL LAMBERSON,
No. 97 Chambers Street, - New York.
These books may also be had at publishers' prices of WM. BLAIR & CO., Chicago,
A. F. SHAPLEIGH & CO., St. Louis, and
R. W. BOOTH & CO., Cincinnati, O.

Bissell & Welles,

Wholesale Hardware Auctioneers,

83 Chambers and 65 Reade Sts., N. Y.

Sales held weekly for the trade. Consignments solicited. We refer to the leading Manufacturers and importers.

TO LARGE CONSUMERS
of fine light
Malleable and Gray Iron Castings.

We can offer special inducements in the way of very superior quality guaranteed, and at fair prices. Being ourselves large consumers and requiring the most perfect castings, other work is ensured the same attention.

MALLORY, WHEELER & CO.,
New Haven, Conn.

CALIFORNIAN AGENCY.

A San Francisco firm of File and Tool makers having an agent constantly traveling among the consumers in the State and West Coast, is desirous of representing some first-class Eastern Houses in the manufacturing hardware trade.
Address **AGENCY, 248 Beale St.,**
San Francisco, Cal.

THE IRON LINE.

For the transportation of
IRON, IRON ORE, COAL, &c.,
Between Lake Champlain, New York, Philadelphia, Pa., Wilmington, Del., and intermediate places. For Freight apply to
F. W. STARK, 33 Coenties Slip, New York.
JOSEPH PHILBRICK, 1201 Beach st. Phila., Pa.

FOR SALE,

Job Lots and Bankrupt Stocks Hardware.

Great bargains offered to the trade.

A. W. WHEELER,
141 Lake St., Chicago, Ill.

Sanderson Bros Steel Co.

A limited number of shares for sale by
EDWARD FRITH & SON,
241 Pearl street, New York.

Trade Report.

OFFICE OF THE IRON AGE,
WEDNESDAY EVENING, September 10, 1879.

Continued large shipments of gold are arriving from Europe, and the receipts since our last report amount to $5,763,962. The local money market continues quite firm, call loans averaging 4 @ 6 %, with 7 % as the exception. Time loans are 5 @ 6 %. Mercantile sells at 5 @ 6 % for prime, with occasional sales at 7 %.

The stock market has been strong and active during the week, with speculative shares feverish and showing a downward tendency. The principal dealings have been in Lake Shore, St. Paul, Northwestern, Western Union, Hannibal and St. Joseph and D. L. & W. We give below the closing quotations of active shares.

United States bonds have been strong both here and in London, and prices have advanced a fraction. We give below the closing quotations of government bonds.

The bank return shows a decrease of $575,850 in surplus reserve, which now stands at $3,183,800, against $13,458,800 at this time last year, and $12,621,975 at the corresponding period in 1877. The loans show a decrease this week of $773,500; the specie is up $69,100; the legal tenders are decreased $1,190,400; the deposits other than United States are down $2,181,800, and the circulation is increased $429,800.

The following is an analysis of the bank totals of this week compared with that of last week:

	August 30.	Sept. 6.	Comparisons.
Loans	$258,160,300	$257,386,800	Dec. $773,500
Specie	19,684,700	19,753,690	Inc. 68,900
Legal t'nd'rs	41,279,300	40,088,900	Dec. 1,190,400
Tot. reserve.	60,964,000	59,842,700	Dec. 1,121,300
Deposits	228,817,400	226,636,600	Dec. 2,180,800
Reserve required	57,204,350	56,658,900	Dec. 545,450
Surplus	3,759,650	3,183,800	Dec. 575,850
Circulation.	20,942,500	21,372,300	Inc. 429,800

The foreign trade movements at the port of New York since our last issue are shown in the following tables:

IMPORTS.

For the week ended September 6:

	1877.	1878.	1879.
Dry goods	$1,497,083	$2,022,241	$2,560,575
General mdse	2,578,643	3,065,246	5,033,246
Total for week.	$4,075,726	$5,085,487	$7,593,817
Prev. reported	227,338,511	132,915,743	209,909,550
Since Jan. 1	$231,464,237	$198,001,230	$217,503,367

Included in the imports were items of merchandise valued as follows:

	Quantity.	Value.
Anvils	396	$3,741
Brass goods	31	5,498
Bronzes	39	9,498
Copper		571
Cutlery	62	19,697
Gas fixtures	1	360
Guns	91	14,604
Hardware	6	1,032
Iron, pig, tons	2,771	33,954
Iron, sheet, tons	140	23,931
Railroad bars	4,067	31,182
I. cotton ties	16,000	13,164
Iron ore, tons	3,348	7,211
Iron, other, tons	4,369	106,955
Lead, pigs	629	2,500
Metal goods	99	16,814
Needles	6	3,242
Nickel	3	1,174
Old metal		4,517
Plated ware	6	376
Percussion caps	60	6,659
Saddlery	8	1,270
Steel	1,339	12,047
Spelter, lbs	110,291	3,847
Silverware	10	973
Tin, bxs	64,132	295,570
Tin, 12,331 slabs	lbs., 750,717	115,484
Wire	18	1,743
Zinc	33,342	1,397

EXPORTS, EXCLUSIVE OF SPECIE.

For week ended September 9:

	1877.	1878.	1879.
For the week	$6,027,457	$8,087,836	$6,217,157
Prev. reported	182,785,454	230,943,918	221,061,748
Since Jan. 1	$183,792,911	$239,036,754	$227,278,905

EXPORTS OF SPECIE.

For the week ended September 6:

Total for the week	$79,700
Previously reported	12,120,241
Total since Jan. 1, 1879	$12,199,941

Government bonds at the close were quoted as follows:

	Bid.	Asked.
U. S. Currency 6's	121 10	122
U. S. 6's 1880 registered	103½	103¾
U. S. 6's 1880 coupon	103½	103¾
U. S. 6's 1881 new registered	104½	104¾
U. S. 6's 1881 coupon	104½	104¾
U. S. 5's 1881 registered	102⅝	102⅞
U. S. 5's 1881 coupon	102⅝	102⅞
U. S. 4½'s 1891 registered	104⅛	104⅜
U. S. 4½'s 1891 coupon	104⅛	104⅜
U. S. 4's 1907 registered	100⅛	100⅜
U. S. 4's 1907 coupon	101¼	101⅜

The following were the closing quotations of active shares:

	Bid.	Asked.
American District Telegraph	66	67¼
Atlantic and Pacific Telegraph	36	36¾
Burlington and Quincy	114¼	115
Canada Southern	62½	63
Canton	41	43
Caribou	5⅝	5¾
Col., Chicago and Indiana Central	7¾	8
Cleve., Col., Cin. and Ind	52¼	52½
Cleveland and Pittsburgh	100	100¼
Chic., St. Paul and Minn	45¼	45¾
Chicago and Alton	92½	93
Chicago and Alton Pref	108	108½
Delaware, Lack. and Western	59¼	60
Delaware and Hudson Canal	48¾	49
Express—Adams	102	103
" American	46½	47½
" United States	43	43¾
" Wells, Fargo & Co	98½	100
Erie	26	26⅛
" Pref	49	49½
Fort Wayne	112	112½
Harlem	155	136
Hannibal and St. Joseph	22½	22¾
" " " Pref	46¼	46½
Illinois Central	90	90¼
Ind., Cincinnati and Lafayette	6⅝	6¾
Kansas Pacific	70	71¼
Kansas and Texas	15⅞	16
Lake Shore	87⅜	87¾
Louisville and Nashville	59¾	60
Michigan Central	81¼	81½
Morris and Essex	90½	91¼
New York Central	118½	119
New Jersey Central	51¾	51⅞
New Jersey Southern	2¾	3⅛
Northwest	80¼	80⅜
" Pref	99	99¼
Northern Pacific	17	17⅜
" Pref	46½	47
Ohio and Mississippi	16⅛	16⅝
" Pref	49⅝	50
Ontario Silver	41¼	..
Pacific Mail	21⅝	21¾
Quicksilver	15	15¼
" Preferred	39½	40
Rock Island and Pacific	138½	141
St. Louis and Iron Mountain	29½	29¾
St. Louis Kansas City Northern	23⅜	23½
" " Pref	59⅛	59¼
St. Louis and San Francisco	13⅝	13¾
" " Pref	18¼	18½
" 1st pref.	43¼	43½
St. Paul	68	68⅛
" Pref	97	97¼
Union Pacific	78½	79
Wabash	40½	40¾
Western Union Telegraph	94⅜	94½

GENERAL HARDWARE.

Business is quite as active as at our last writing, and the same upward tendency in prices, which was so prominent a feature of our report of last week, prevails.

In foreign Hardware there is a good business doing, and while the tone of the market is firm, no changes in values are reported.

The manufacturers of Strap and T Hinges held a meeting in this city to-day, at which the price of these goods was advanced to discount 50 and 10 per cent. The quantity discount remains as before. The following makers, comprising the association of Strap and T Hinge Mfrs. of the U. S., were represented at the meeting: Roy & Co., E. W. Gilmore & Co., Stanley Works, Sargent & Co., McKinney Mfg. Co., Perin & Gaff Mfg. Co., Lewis, Oliver & Phillips, C. Hager & Bro., Wheeling Hinge Co.

The American Screw Company have issued the following circular announcing an advance in the price of Stove Bolts to discount 50 per cent. Russell, Burdsall & Ward, Port Chester, N. Y., have advised us of a similar advance:

PROVIDENCE, September 9, 1879.

GENTLEMEN: We beg to advise you that we have this day advanced the price of Stove Bolts, and, withdrawing previous quotations, now quote Stove Bolts, per price list, 50 per cent. discount. Terms cash, 30 days. Freight prepaid to New York, Boston, Philadelphia and Baltimore. To other cities freight is not prepaid, but will not exceed that from New York city. Soliciting your orders, which will have our careful and prompt attention, we remain, yours very respectfully, AMERICAN SCREW CO.

Sargent & Co. have made the following changes in prices:

Page in 1877 Catalogue.		Discount per cent.
36—No. 98, Hook Hinges:		
	8, 10 and 12 in.. $5.55 per 100 lb.	Net
	14 and longer, $4.25	Net
260—No. 60, Brass Hooks and Eyes		65
260 A—No. 61, Brass Hooks and Pins		65
261—Nos. 65 and 61, Brass Hooks and Eyes		65
261 to 268—Bright Wire and Brass Wire Goods, revised list of July 8, 1879		35
399—Nut Cracks		70
406—Sad Iron Stands		60
407—Coffee Pot Stands		50

10 per cent. extra discount for prompt cash.

We have received the following:

NEW YORK, September 10, 1879.

From this date the discount on Spring Balances will be 25 per cent., with an additional 10 per cent. for cash in 30 days.

JOHN CHATILLON & SONS.
LANDERS, FRARY & CLARK.
CHARLES FORSCHENER,

The manufacturers of Bright Wire Goods have advanced their price from 40 per cent. discount to 35 per cent. discount, with 10 per cent. for cash in 30 days.

At a meeting of the Plane Manufacturers' Association, held in this city on the 9th and 10th instants, the following discounts on Planes were adopted: Bench, Molding and Plow Planes, discount 35 per cent; Common Bench Planes, discount 45 per cent. Terms, 30 days or 10 per cent. extra for cash in 10 days.

The Table Cutlery Manufacturers' Association of the United States have issued the following circular:

[*Circular No. 10.*]

Office of the
TABLE CUTLERY MANUFACTURERS' ASSOCIATION OF THE UNITED STATES.

We have this day advanced the list prices of all Scale Tang Knives and Forks and of all Solid Wood Handle Knives and Forks 50 cents per gross. Butcher Knives with Association brand, add to list 10 cents per dozen. Prices subject to change without notice. Yours truly,

JOHN RUSSELL CUTLERY CO.
LAMSON & GOODNOW MFG. CO.
LANDERS, FRARY & CLARK.
MERIDEN CUTLERY CO.
BEAVER FALLS CUTLERY CO.
AMERICAN CUTLERY CO.

NEW YORK, Sept. 4, 1879.

The advance in Table Cutlery is, we believe, very general, not being confined to the members of the association. We are informed of a similar advance by the Frary Cutlery Co., and the New York Knife Co., of Walden, N. Y. The New York Knife Co. also advise us of an advance of 5 per cent. on the net list of their Pocket Cutlery.

P. & F. Corbin, New Britain, Conn., and 87 Chambers street, New York, have changed the price on their No. 54 Japanned Plated Tip Loose Pin Butts from discount 75 and 10 per cent. to discount 70 and 10 per cent., net cash.

Foxell, Jones & Co., manufacturers of Hollow-Ware, Auburn, N. Y., under date of 8th instant, say: "Owing to the advance in iron, prices have been advanced, and we now quote 60 and 2½ per cent., 4 months. Freight allowed to Chicago or St. Louis on car-load lots."

Humason & Beckley Mfg. Co. have advanced their prices on Wrought Iron Goods, including Hooks and Staples, Hasps and Staples, Awning Hooks, Meat Hooks, &c., 10 per cent. We are informed that other makers of similar goods have advanced their prices.

The M. A. Hunt Mfg. Co., Cincinnati, Ohio, have appointed Fernald & Sise, No. 100 Chambers street, agents for their "15th Amendment" Mouse Traps.

The following circular explains itself:

AMOSKEAG AX CO.,
MANCHESTER, N. H., June 2, 1879.

The Amoskeag Ax Company have sold and transferred to the Underhill Edge Tool Company, of Nashua, their machinery, good will and Franchise.

In future all communications should be addressed to them.

MOODY CURRIER, Treasurer.

UNDERHILL EDGE TOOL CO. AND AMOSKEAG AX COMPANY (CONSOLIDATED).
NASHUA, N. H., Sept. 1st, 1879.

The Machinery of the Amoskeag Company being set up and in perfect running order in connection with our own, we are prepared to fill orders promptly. Our purchase included also their Dies, Cuts, Stamps, Lables, &c. Customers preferring the Amoskeag Stamp, or any other special brand, (Crescent, Canadian, Blodgett, O. H., &c.) can have it the same as heretofore. Awaiting your favors, we remain, Respectfully yours,

C. B. HILL, Treasurer.

FERNALD & SISE, New York, Agents.

The manufacturers of Wire have advanced the prices of Bright and Annealed Wire, Coppered Wire and Annealed Fence and Grape Wire, since our last writing. The revised prices will be found under the head "New York Wholesale Prices" on another page.

Attention is invited to the advertisement of E. S. Wheeler & Co., offering Bessemer Wire Rods, which appears on the opposite page.

John Chatillon & Sons have issued the following circular and new pages for insertion in their 1876 price list:

NEW YORK, September 1, 1879.

DEAR SIR: We herewith inclose you new pages to be inserted into our list of July 1, 1876, which will bring to your notice such new goods as we have added to our line since our last price list was issued.

You will please cut out pages 33 and 34, and insert new pages 33 to 34D. Also cut out pages 47 and 48, and insert new pages 46A to 48. Also cut out pages 61 and 62, and insert new pages 61 and 62.

The discount on the above goods is the same as that on other goods of the same class named in our discount sheet of January 1, 1879, excepting the discount on Common Japanned Patent Balances, which is changed to 40 per cent.

Trusting that you will continue to favor us with your orders, we remain, yours truly,

JOHN CHATILLON & SONS.

89, 91 and 93 Cliff street.

CIRCULAR SPRING BALANCES.

With Glass Sash and White Porcelain Enameled Fronts.

Boston Market Scales.

With Heavy Tin Pan and Iron Bows.

	Per dozen.
No. 0268T, 30 lbs. by 1 oz	$112.00
No. 0278T, 60 lbs. by 2 oz	120.00

With Heavy Copper Pan, Tinned Inside, and Iron Bows.

No. 0268, 30 lbs. by 1 oz	$132.00
No. 0278, 60 lbs. by 2 oz	140.00
No. 0288, 120 lbs. by 4 oz	240.00

With Heavy Copper Pan, Tinned Inside, and Brass Bows.

No. 0269, 30 lbs. by 1 oz	$164.00
No. 0279, 60 lbs. by 2 oz	172.00
No. 0289, 120 lbs. by 4 oz	264.00

For cut showing No. 0269 Scale see page 32.

With Marble Plate and Brass Bows.

No. 0269M, 30 lbs. by 1 oz	$172.00
No. 0279M, 60 lbs. by 2 oz	184.00

For cut showing No. 0279M Scale see page 33A.

With Porcelain Plate and Brass Bows.

No. 0269P, 30 lbs. by 1 oz	$172.00
No. 0279P, 60 lbs. by 2 oz	184.00

Glass Front and Iron Frame, with Heavy Tin Pan and Iron Bows.

	Per doz.
No. 3268 T, 30 lbs. by 1 oz	$124
No. 3278 T, 60 lbs. by 2 oz	132

With Heavy Copper Pan, Tinned Inside, and Iron Bows.

No. 3268, 30 lbs. by 1 oz	144
No. 3278, 60 lbs. by 2 oz	156

With Heavy Copper Pan, Tinned Inside, and Brass Bows.

No. 3269, 30 lbs. by 1 oz	176
No. 3279, 60 lbs. by 2 oz	184

With Marble Plate and Brass Bows.

No. 3269M, 30 lbs. by oz	176
No. 3279M, 60 lbs. by 2 oz	184

With Porcelain Plate and Brass Bows.

No. 3269 P, 30 lbs. by 1 oz	176
No. 3279 P, 60 lbs. by 2 oz	184

These Scales are made with all styles of pans described on page 31 and 33. When ordering by number substitute the number 2 in place of the 0. Price $9 per dozen advance on the net price of Scales on pages 31 and 33.

With white porcelain enameled fronts, glass sash, and patent enameled pans, nickel-plated bows.

	Per doz.
No. 0256½, 15 lbs., by ½ oz	$112
No. 0266½, 30 " by 1 "	112
No. 0276½, 60 " by 2 "	128

With granite finished fronts, glass sashes and patent granite-finished pans, nickel-plated bows.

	Per doz.
No. 1256½, 15 lbs., by ½ oz	$112
No. 1266½, 30 " by 1 "	112
No. 1276½, 60 " by 2 "	128

With Hook.	Each.
No. 300, 100 lbs. by ½ lb	$7
No. 310, 150 lbs. by ½ lb	8
No. 320, 200 lbs. by 1 lb	10
No. 330, 250 lbs. by 1 lb	11
No. 340, 300 lbs. by 1 lb	12
No. 350, 400 lbs. by 1 lb	15
No. 360, 500 lbs. by 1 lb	..
No. 370, 600 lbs. by 1 lb	..

THE UPRIGHT FAMILY SCALE.

With Attachment for taking the Tare, Patented, Complete, with Tin Scoop, weighing 12 lbs. by ¼ lb.

No. 35, packed 1 doz. in a case.....per doz. $16.00

CHATILLON'S MARKET SCALE.

The best Market Scale in use, having all the latest improvements for taking the Tare.

No. 69, 32 lbs. by 1 oz., Marble Slab, each, net,	$12.00
No. 70, 64 lbs. by 2 oz., " " "	14.00

TURNBULL'S PATENT MARKET SCALES.

Patented June 2, 1874.

No. 26, 16 lbs. by ½ oz., Marble Slab...each,	$11.00
No. 33, 32 " 1 " " " "	12 00
No. 43, 64 " 2 " " " "	14.00

HATCH AND TEA SCALES.

Tea Scales.

No. 160, Plain Japanned, with 2 pounds weights.....per doz.	$14.00
No. 161, Plain Japanned, with 4 pounds weights.....per doz.	15.00

Hatch Even Balance Scales.

No. 171, Plain Japanned, with 8 pounds weights.....per doz.	$36.00
No. 173, Ornamented, with 8 lbs. weights, per doz	42.00

Packed 1 in a box.

PATENT HAND SCOOPS.

Tin.

	Per doz.		Per doz.
No. 00	$3.50	No. 2	$8.00
No. 0	5.00	No. 3	9.00
No. 1	6.50	No. 4	11.00

Brass.

	Per doz.		Per doz.
No. 00	$7.50	No. 2	$14.00
No. 0	9.00	No. 3	19.00
No. 1	11.00	No. 4	22.00

BAG FILLERS.

Tin.

	Per doz.		Per doz.
No. 1	$3.50	No. 4	$8.00
No. 2	5.00	No. 5	9.00
No. 3	6.50		

Brass.

	Per doz.		Per doz.
No. 1	$9.00	No. 4	$16.00
No. 2	12.00	No. 5	19.00
No. 3	14.00		

BRASS TWINE BOXES.

No. 1, To hold 4-inch Ball	per doz. $15.50
No. 2, " 4½-inch Ball	" 17.00

COMMON JAPANNED PATENT BALANCES.

Heavy, No. 1.

	each.		each.
150 lbs. and under	$1.50	550 lbs. and under	$3.20
200 lbs.	1.50	600 lbs.	3.60
250 lbs.	1.75	650 lbs.	3.75
300 lbs.	2.00	700 lbs.	4.00
350 lbs.	2.20	800 lbs.	4.50
400 lbs.	2.60	1000 lbs.	6.00
450 lbs.	2.75	1200 lbs.	7.00
500 lbs.	3.00		

Light, No. 2.

	each.		each.
150 lbs. and under	$1.15	550 lbs.	$2.80
200 lbs.	1.20	600 lbs.	3.20
250 lbs.	1.45	650 lbs.	3.30
300 lbs.	1.75	700 lbs.	3.60
350 lbs.	2.00	800 lbs.	3.90
400 lbs.	2.40	1000 lbs.	4.75
450 lbs.	2.55	1200 lbs.	5.50
500 lbs.	2.65		

We do not make any Common Patent Balances heavier than 1200 lbs.

BEST JAPANNED PATENT BALANCES.

	Each.		Each.
100, 150, 200, 250 lbs	$6.00	1000 lbs.	$19.00
300 lbs.	6.50	1200 lbs.	21.00
400 lbs.	8.00	1500 lbs.	25.00
500 lbs.	10.00	2000 lbs.	32.00
600 lbs.	12.00	2500 lbs.	37.00
700 lbs.	14.00	3000 lbs.	43.00
800 lbs.	16.00		

BEST POLISHED PATENT BALANCES.

	each.		each.
100, 150, 200, 250 lbs	$7.50	1000 lbs.	$23.00
300 lbs.	9.00	1200 lbs.	25.00
400 lbs.	12.00	1500 lbs.	34.00
500 lbs.	14.00	2000 lbs.	42.00
600 lbs.	16.00	2500 lbs.	48.00
700 lbs.	18.00	3000 lbs	51.00
800 lbs.	20.00		

BRASS PATENT BALANCES.

100, 150 lbs., with Iron Poises	each, $15.00
200, 250 lbs., " "	" 15.00
300 lbs., " "	" 20 00
400 lbs., " "	" 24.00
500 lbs., " "	" 28.00
600 lbs., and upward, with Iron Poises, per 100 lbs	5.00

Iron Poises will always be sent with the above, unless Brass Poises are ordered specially.

COTTON BEAMS.

New York Pattern (Notched Top).

	Each.
Pol'd Beams, Weighing 640 lbs. on each side.	$30.00
" " " 800 lbs. "	32.00
Jap'd " " 640 lbs. "	24.00
" " " 800 lbs. "	26.00

New Orleans Pattern (Smooth Top).

Pol'd Beams, weighing 640 lbs. on each side.	$32.00
" " " 800 lbs. "	34.00
Jap'd " " 640 lbs. "	26.00
" " " 800 lbs. "	28.00

POISES.

Lbs	1	2	4	8	16	32	64
Iron	$0.20	$0.30	$0.40	$0.75	$1.50	$2.50	$4.00
Brass	2.50	2.00	4.00	7.00	10.00	17.00	26.00

Arnold & Co., Norwalk, Conn., have issued an illustrated pamphlet of specialties in Hardware manufactured by them. We print below their price list and discounts:

"Giant" Truck Casters.

Size of Wheel, in..	2	2½	3	4	4½
Each	30c.,	33c.,	33c.,	58c.,	61c.

Discount, 25 per cent.

Stationary Truck Casters.

Size of Wheel, in	3	4	4½
Each	25c.,	35c.,	55c.

Discount, 55 per cent.

The "Boss" Anti-Friction Hanger.

No. 4, corresponding to 3 in., 4 in., 5 in., Common Hanger; No. 6, corresponding to 6 in., 8 in., Common Hanger, per pair.....$1.25

Discount, 50&10 per cent.

The "Boss" Anti-Friction Roller.

No. 1, per pair	50c.
No. 2, "	75c.

Discount, 10 per cent.

The "Best" Anti-Friction Hanger.

No. 1, corresponding to 3 in., 4 in., 5 in., Common Hanger; No. 2, corresponding to 6 in., 8 in., 10 in., Common Hanger, per pair.....$1.25

Discount, 50&10 per cent.

The Improved "Novelty" Hanger.

Size of Wheel, in..	4	5	6	8
Per pair	$1.00	$1.25	$1.50	$2.25

Discount, 50 & 10 per cent.

"Novelty" Door Roller.

Size of Wheel, in	5	6	8
Per pair	42c.,	55c.,	70c.

Discount, 10&10 per cent.

The Atlantic States Nail Association, at a meeting held in this city on Thursday last, advanced prices to $2.75, net, for 10d to 60d. For orders of 200 kegs and over an abatement of 10 cents per keg is allowed. The demand is generally reported good, and sellers have little trouble in securing all the business they want at current rates, but for future delivery at these figures it would be difficult to make large contracts, as further advances are already freely talked of. In Pittsburgh the price has advanced to $3.60 days, with 10 cents off for carload lots and 2 per cent. for cash, making the minimum net figure there $2.85. In Wheeling the card rate has been advanced to $2.75. Nails are reported scarce in this market and at the mills. We quote 10d to 60d, $2.75, net, for lots less than 200 kegs. The following is the new card issued under date of 4th inst.

NEW YORK, September 4, 1879.

Common, Fence and Sheathing	Per keg.	Coopers', Slating, Tobacco, Warehouse and Edge Gripe Fence.	Per keg.
10d to 60d	$2.75		
8d and 9d	3.00	10d and larger	$3.25
6d and 7d	3.25	8d	3.50
4d and 5d	3.50	6d and 7d	3.75
3d	4.25	4d and 5d	4.00
3d fine	5.00	3d slating	4.75
Spikes of all sizes			$7.00

Box and Flooring.	Per keg.	Bradhead, or Finishing.	Per keg.
10d and larger	$3.50	10d and larger	$3.75
8d	3.75	8d	4.00
6d and 7d	4.00	6d and 7d	4.25
4d and 5d	4.25	4d and 5d	4.50

Fine Finishing, $1.25 a keg above same size common.

Clinch Nails.

	Per keg.	Half keg.
3 in. and larger	$4.25	$2.25
2½ and 2¾ in	4.50	2.38
2 in. and 2¼ in	4.75	2.50
1¾ in	5.00	2.63
1½ in	5.25	2.75

IRON.

American Pig.—We see no abatement in the demand for raw Iron, and it is a subject of wonder how an industry which had been almost paralyzed for a long time should, in a few short months, spring into such wonderful activity and continue its upward progress without suffering even the mortification of a temporory reaction. We hear of a large business in small lots at very full figures, and a sale of 1200 tons of a Lehigh brand, for delivery late this year, at prices ruling date of shipment; and in addition 12,000 tons Nos. 1, 2X and No. 2, for delivery during the first half of 1880, at $22, $21 and $20, respectively. There are inquiries on the market for large lots which are speculative, but there seems to be no disposition among makers to sell more Iron than is required for the legitimate demands of the trade, and the large blocks noted above are, we are informed, all sold to large consumers. We quote: Foundry No. 1, $22 @ $23; Foundry No. 2, $21 @ $22; Gray Forge, $20 @ $21.

Scotch Pig.—About 800 tons of Scotch Iron, all sold to arrive, reached this port during the week. There is a rumor that 40,000 tons of Scotch Iron is about to be placed on this market, but we are unable to trace it; we see, however, the following news by cable in an evening paper, which may have some connection with the rumor above referred to: "LONDON, Sept. 10.—At Middlesboro, a large Iron manufacturing locality, an order was received from the United States for 60,000 tons of Pig Iron." Sales during the week, in addition to a good business in small parcels, included 10,000 tons to arrive. We quote: Eglinton, $21 @ $21.50; Coltness, $23.50; Glengarnock, $22, and Gartsherrie, $22.50.

Rails.—No transactions either in Steel or Iron Rails have come to our notice this week. We quote: Steel, $49 @ $50, and Iron, $40 @ $42.

Old Rails.—Sales are reported of between 5000 and 6000 tons of Old Rails, to arrive, at $26.25 @ $27. We quote, nominally, $26 @ $27.50.

Scrap.—We hear of sales of about 1200 tons No. 1 Wrought, to arrive, at $25 @ $25.50. We quote No. 1 Wrought from yard, $25.50 @ $26.

METALS.

Copper.—The market has continued in a state of apathy, both here and in Europe, during the week under review, sales being confined to 75,000 pounds Lake Superior at 16¾¢ @ 16½¢, which is at the same time the nominal quotation for Baltimore. There is nothing new per cable from London nor from Valparaiso. We have received papers from the latter place and from Lima to the end of July, when there was much discontent expressed in Chili at the slow progress of operations both on land and at sea, while in Peru financial affairs were in a terrible condition. The mediation of the United States, which we presume has been going on at Santiago in the meantime, and will be resumed at Lima after a while, probably, has, therefore, from all appearances every prospect of a speedy success, and of thus terminating a war which should never have been undertaken. But whatever the result of similar negotiations may be, it is not likely to affect Copper in any shape. "London, August 30: This market remains quiet, and sales are still limited. There has nothing further transpired in statistics, but the announcement that the charters are expected in the course of a day or two. Manufactured is dull, but owing to the slightly higher prices demanded for the raw material, sellers are disinclined to make concessions." There has been no change in the combination prices of Manufactured Copper. We quote: New Sheathing Copper, 22¢; Braziers, 24¢; and Bolts, 24¢; Bottoms, 26¢; American Yellow Sheathing Metal, 13½¢; Yellow Metal Bolts, 20¢; and English Yellow Sheathing Metal, 12¢ @ 12½¢, in bond.

Tin.—Soon after our last report was written a fresh advance was cabled from London and the East, and great activity developed here, followed this week by less excitement thus far. London quotes Straits £71. 10/, Singapore $22.50 per picul and Penang $22, with an exchange of 3/9½. The tendency remains a good one, and may lead to further improvement on both sides the Atlantic, the market closing strong at the following quotations for large lots: Straits, 16¾¢; Common English, 16½¢ @ 16¾¢, and Banca, 18½¢. We still receive by mail the following message from Messrs. Kreglinger & Co., Rotterdam, August 20: "A weaker feeling prevailed for Tin last week, and prices gave way 75¢, but the market looks firmer again, without any sellers of Banca under 40.75 guilders the 50 kilos., and of Biliton under 40.50." "London, August 30.—Throughout the week sellers have displayed considerable firmness in regulating their quotations, and the prices quoted in our last issue have not only been maintained, but have also been advanced, and fine foreign is now quoted at £69. 5/ @ £69. 10/ per ton. The better prices realized are grounded upon the expectation of improved statistics at the end of the month and reduced supplies from Australia. Next week something will be known definitely with regard to the wages dispute between

the Tin Plate makers and their men, and naturally holders are eager to know what arrangements will be made, as prices will doubtlessly be affected by the decision. English Blocks and Ingots have advanced to £71; Bars, £72 and 10/ extra, as usual, for half barrels." The *Tin Plate* market has been active and strong. We quote at the close the following range for ordinary brands, large lots, per box: Charcoal Bright, $6.12½ @ $6.25; do. Ternes, $5.75 @ $5.87½; Coke Tin, $5.25 @ $5.37½, and do. Ternes, $5 @ $5.25. Cable quotations are strong all along the line. There has been quite an advance both in Block Tin and Pig Iron in England, and although the makers of Tin Plates are getting better prices, their position is, in view of the higher cost of the raw material, in reality little better than it was before.

Lead.—Activity in the Lead market has been confined to a jobbing trade, sales summing up some 150 tons. Corroding Lead has likewise been dull. We quote: Common Domestic, 4¢, and Corroding, 4.20¢. The general tendency is a weaker one. "London, August 30.—The value of this metal has materially improved, the price for Common Pig Lead now being £14. 15/, and choice brands are quoted at 5/ @ 7/6 higher, and £16 is asked for Sheet Lead." Manufacturers' prices are unchanged. We quote: Bar, 5¢; Pipe, 5½¢; Sheet, 6¢; Tin-lined Pipe, 12¢; No. 1 Solder, 10¢; all less 10 % to the trade.

Spelter and Zinc.—A steady jobbing demand continues to prevail and is filled at 6¢, but the more important consumers of Common Domestic Spelter are holding off in view of the improvement which has been established. By reason of the diminishing supply holders, nevertheless, do not feel inclined to abate in their demands, and continue to insist on 6¢ for round lots. At the West, smelters have extensively sold again to the rolling mills at 5½¢ at the works, and not much, if anything, can be expected thence in the course of this month. The syndicate on the Continent seems to contemplate a further advance for September delivery, and the advices from there are very strong. From London, August 30, we receive the following: "Considerable activity has recently been displayed in this metal, and it now occupies a vastly improved position. The upward movement appears to have been very well managed, and from all accounts is likely to be upheld. A good control is held over the production as well as the stock, and buyers, seeing their chance of buying at any reduction fast diminishing, have wisely availed themselves of the opportunity of placing their orders. A little extra demand for consumption, combined with speculation, soon makes an impression upon a cheap metal like Spelter. It is not often that an occasion so favorable for speculation presents itself, and there is no doubt that those who have been fortunate enough to buy will make a very satisfactory profit." *Sheet Zinc* is unaltered at 7½¢ @ 7¾¢.

Nickel.—There is a steady market, supported by a moderate demand, at $1.25.

Antimony.—The tendency has remained an upward one, and we quote the metal firm at 12¢ @ 12½¢, according to brand and quantity.

COAL.

During the week there has been a very earnest effort made by the managers of the companies to come to some understanding, so that the production of coal may be limited and prices controlled. The great point has been to decide upon what means shall be employed for accomplishing this result. Some of the companies are strongly in favor of a system which shall permit by turns "all work and all play." That is, there are to be total suspensions by all the mines until the market price of coal has reached a figure at which coal can be mined at a profit, then all the companies are to work until the price falls below the limit fixed, the average being made say once a month. This plan finds great favor with some of the companies, as by it the vexatious question of quotas is entirely avoided, and it is hoped that a general assent to the plan can be obtained. It was even reported yesterday that an agreement to this proposition could have been obtained, if it had not been for the fact that some of the companies were not yet informed in regard to the amount of coal contracted for by these operators. Some of the companies say that it would be necessary for them to supply their line trade during any suspensions that might be ordered. Upon the surface all is harmonious. Mr. Gowen expresses himself perfectly satisfied to adopt any plan that will enable the managers to benefit the whole trade. The Lehigh Valley people say that all their operators are agreed and ready to take any plan that does not involve the arrangement of percentages, while the other parties seemed to be ready to give their assent to any plan which the representatives of the company may adopt. There are some little facts nicely kept out of sight at the present time which may, when the settlement comes to be made, seriously interfere with the harmony of the arrangements. Among these is the difficulty which Mr. Gowen will have in stopping, one of the necessities of his position seeming to entail continuous work. It will naturally be said by the Delaware and Hudson Canal Company that they cannot afford to stop in the fall, as it shuts them off from using their canal, while only a small time remains before the close of navigation. Various other interests, too, will find the proposition bearing heavily upon them, and will not fail to make their objections known when the final vote comes to be taken. The value of the scheme is somewhat doubtful, in the light of the statement which has already been made, that some of the companies will put on double force, if necessary, and push their breakers to their utmost capacity during the weeks when work is going on, and so will actually mine about as much in two weeks as they now do in four. Buyers in the city, taking all these points into consideration, seem to think that there is little chance for a combination to be successful at the present time. They are, however, buying freely, and are stocking up as rapidly as they can conveniently find vessels. Most dealers here seem to think that the present prices are as low as can be expected this season, and hence they are putting in Coal. Business is in consequence quite good. Heavy stocks are reported all through New England, not only in yards, but manufacturers have in many cases laid in a year's supply. Private families have also taken large amounts of Coal, in order to take advantage of the low prices. It can hardly be expected that the fall trade will be as good or as great in quantity as in years when only a small amount of domestic Coal has been worked off through the summer. Prices are various, and depend largely upon the skill of the buyer. The auction sale averages, which are a sort of base line to measure from, were: Grate, $2.04¼; Egg, $2.15; Stove, $2.38; Chestnut, $2.20. Lehigh Coal is quoted at: Lump, $3.30; Broken Egg and Stove, $2.60; Chestnut, $2.50.

The Pennsylvania Coal Company quote at Newburgh, with 50¢ per ton freight to New York: Lump, Steam and Grate, $2.20; Egg, $2.25; Stove, $2.50; Chestnut, $2.35.

The Philadelphia and Reading make the following prices in New York:

	Broken.	Egg.	Stove.	Chestnut.
Hard white ash	$2.60	$2.60	$2.60	$2.50
Free-burning white ash	2.30	2.40	2.60	2.40
Schuylkill red ash	....	2.75	2.90	2.50
Lykens Valley vein, (Brookside)	3.85	3 85	3.85	3 25

Lump and Steamboat are $3.50.

Freights are without special features of note; vessels are still scarce. We quote Boston as $1.10 @ $1.15; Portland, 95¢ @ $1 and discharged; Providence, 86¢, and New Haven, 50¢ @ 60¢.

EXPORTS

Of Hardware, Iron, Machinery, Metals, &c., from the Port of New York, for the Week ending September 9, 1879:

	Quan.	Value.
Danish West Indies.		
Guns, cs	1	$12
Mf. iron, pkgs	1	19
Dutch West Indies.		
Ag. imp., pkgs	30	132
Pltdware, cs.	3	237
Ptlm., gal	5621	514
Tacks, cs	2	46
Nails, bxs	6	125
Revolvers, cs.	2	310
Per caps, cs	3	120
Hdw., cs	14	112
Rotterdam.		
Ptlm., gals	433,308	29,950
Antwerp.		
Ptlm., gals	441,755	35,325
Konigsberg.		
Ptlm., gals	134,667	9,400
Hamburg.		
Mach'y, cs	45	4,955
Pumps, pkgs	3	100
Belting, bale	1	73
Sew. mach. cs	1265	21,114
Hdw., cs	106	2,682
Glassw'e, cs	2	130
Brass, box	1	190
Ag. imp., pkgs	11	1,029
Crucfb., hhds	36	810
Ptlm., gals	289,235	23,140
Mf. iron, pkgs	2	70
Bremen.		
Ptlm., gals	742,022	51,360
Mach'y, cs	7	1,105
Hdw., cs	15	849
Belting, cs	2	200
Mf. iron, pkgs	6	225
Pltdware, cs	1	75
Liverpool.		
Mach'y, cs	47	8,199
Sew. mach., cs	4	55
Lub. oil, gals.	988	572
Belting, bale	1	62
Hdw., cs	174	8,866
Mf. iron, pkgs	2	75
London.		
Glassw're, cs.	65	864
Slates, cs	45	200
Hdw., cs	389	10,532
Mf. iron, pkgs	31	500
Slate, tons	168	3,000
Ox. zinc, bbls	200	1,420
Mach'y, cs	200	11,482
Springs, cs	1	75
Sew. mach., cs	73	1,445
Ptlm. gals	887,382	67,714
Pumps, pkgs.	8	405
Hull.		
Ox. zinc, bbls	10	71
I pipes	119	271
Hdw., pkgs	1	20
Pumps, pkgs.	10	1,200
Canada.		
Glassw'e, cs	13	240
British Guiana.		
Ptlm., gals	3000	300
British East Indies.		
Ptlm., gals	505,000	53,056
British West Indies.		
Notions, cs	5	1,002
Y metal, cs	2	140
Mf. iron, pkgs	14	284
Hdw., cs	41	612
Ptlm., gals	13,319	1,135
Nails, kegs	28	169
Iron, pkgs	5	61
Glassw'e, cs	33	216
Mach'y, pkgs.	14	1,114
British Australia.		
Glassw'e, cs	14	301
Mf. iron, pkgs	46	1,166
Sew. mach., cs	2	156
Iron safes	11	2,200
Fibrs. mtl. pgs	12	360
Ag. imp., pkgs	96	2,380
Pumps, pkgs.	23	1,475
Hdw., cs	373	6,759
Mach'y, cs	3	328
Belting, bale	1	242
Pltdware, cs	22	1,252
RR cars' pkgs	313	9,000
British North American Colonies.		
Retorts	5	300
Coal, tons	390	878
Ptlm., gals	1730	177
Coal, tons	1047	2,603
I pipes, tons	35	350
Hdw., cs	63	443
Havre.		
Ptlm., gals	371,381	18,100
Ag. imp., pkgs	44	2,307
Alicante.		
Ptlm., gals	112,510	9,000
Vigo.		
Ptlm., gals	43,400	3,798
Mf. iron, pkgs	5	100
Palma.		
Ptlm., gals	98,320	7,865
Canary Islands.		
Ptlm., gals	7933	975
Constantinople.		
Ptlm., gals	152,240	12,200
Mach. oil, gals.	148	48
Pumps, pkgs.	18	795
RR matls., pgs	10	785
Belting, cs	3	434
Sandp'per, cs	2	140
I safes	2	600
Glassw'e, pgs.	29	401
Irons, cs	150	380
Ptlm., gals	143,600	14,418
Ag. imp., pkgs	56	1,294
Mf. iron, pkgs	419	4,919
Lub. oil, gals	2037	1,460
Pltdware, pgs	111	2,188
W. machs., cs	4	56
Gages, cs	1	59
Tacks, cs	111	740
Cutlery, cs	9	582
Hdw., pkgs	339	5,681
Telephones, cs	2	136
Iron, cs	8	546
Revolvers, cs.	1	130
Cuba.		
R. R. mtl., pgs	709	1,626
Mf. iron, pkgs	66	1,083
Hdw., cs	122	2,304
Mach. oil, gals	240	134
S. w. appr	2	100
Sew. mach., cs	57	1,431
Grindstones	159	344
Iron, bdls	9	55
RR cars	3	525
Nails, bxs	70	150
Pit'dware, cs.	3	95
Iron, tons	69	1,050
Glassw'e, cs	42	1,074
Mach'y, cs	48	2,858
Nails, kegs	260	669
Belting, bales	2	338
Plate glass, cs	2	70
Ptlm., gals	2250	208
Gas fixt., pkgs	4	107
Ag. imp., pkgs	14	102
Salonica.		
Ptlm., gals	100,000	$8,000
Glasgow.		
Glassw'e, cs	7	175
Bullets, cs	5	50
Tin cans, cs	2000	1,200
Needles, case	1	1,824
Lub. oil, gals.	512	200
Rifles, case	1	29
Cartridges, cs	1	91
Mach'y, cs	6	2,000
Sew. mach., cs	2	30
Nails, kegs	60	129
Fittings, case	1	187
Belting, cs	1	500
Barcelona.		
Pltd.ware, pgs	11	973
Glassw'e, cs	2	56
Belting, cs	1	200
Porto Rico.		
Cars	15	64
Ptlm., gals	6000	600
Ag. imp., pkgs	6	230
Sew. mach., cs	1	69
Africa.		
Ptlm., gals	122,673	9,532
Hayti.		
Glassw'e, cs	5	135
Sew. mach., cs	10	235
Ptlm., gals	2010	184
Cutlery, cs	2	174
Argentine Republic.		
Hdw., cs	21	400
Refrigerators	23	193
Glassw'e, cs	20	292
Pumps, pkgs.	4	350
Ptlm. gals	50,000	4,500
Ag. imp., pkgs	24	432
Pltdware, cs	17	1,001
Mexico.		
Hdw., pkgs	46	1,475
Gas fixt., cs	1	78
Mf. iron, pkgs	147	830
Nails, kegs	130	328
Mach'y, cs	186	4,534
Tin plates, bxs	15	101
RR cars	6	430
Ag. imp., pgs.	15	143
Pistols, cs	2	505
Revolvers, cs.	1	757
Ptlm., gals	12,100	1,300
Sew. mach. cs	34	1,401
Cutlery, cs	52	1,461
C'ridges, bxs.	7	241
Telepho. pgs.	2	87
Glassw'e, cs	27	248
RR matls., pgs	24	807
Fire arms, cs.	7	1,707
Wire, reels	10	110
Central America.		
RR malts., pgs	212	11,400
Hdw., cs	335	5,631
Iron, kegs	24	73
Ag. imp., pkgs	12	280
Nuts, bags	10	50
Shot, bxs	11	148
Pumps, pkgs.	6	247
Zinc, casks	2	88
Hdw., cs	4	144
Grindstons	94	60
Ptlm., gals	40,107	4,633
Glassw'e, pgs	135	1,125
Nails, kegs	117	498
Gas fixt., pgs.	5	400
Pistols, cs	2	85
Mf. iron, pkgs	217	2,221
Powder, lbs	683	203
Notions, cs	6	530
Sew. mach, cs.	80	1,637
Cutlery, cs	6	292
Venezuela.		
Hdw., cs	13	471
Tacks, bxs	22	139
Mach'y, cs	3	253
Ptlm., gals	4800	478
Car matls, pgs	219	3,640
Trucks	6	68
Zinc, bbls	5	40
In'lators, bbls	39	1,504
Brazil.		
Mach'y, pkgs.	24	1,308
Trucks, cs	10	225
Gas fixt. bxs.	2	76
Sew. mach., cs	115	2,047
Notions, cs	10	1,250
Chili.		
Ptlm., gals	114,000	10,330
Sew. mach, cs	7	266
Mf. iron, pkgs	441	1,900
Nails, kegs	1200	4,000
Powder, lbs	47,500	5,320
Mach'y., pkgs	2	82
Glassw'e, pgs.	137	2,727
Hdw, pkgs	43	1,612
Ag. imp., pkgs	134	2,000
Coal, tons	75	300
Peru.		
Mf. iron, pkgs	999	21,223
Ptlm., gals	110,005	8,564
Glassw'e, pgs.	517	3,058
Hdw., pkgs	34	967
Slates, cs.	10	63
Sew. mach., cs	185	2,078
Ag. imp., pkgs	55	656
Mach'y, pkgs.	5	170

IMPORTS

Of Hardware, Iron, Steel and Metals into the Port of New York, for the Week ending Sept. 9, 1879:

Hardware.

Bloomfield J. C. & Co.
Mdse., pkgs., 66
Boker, Hermann & Co.
Hdw., cs., 236
Hdw., csks., 17
Bowen G. M.
Iron cargo lighters, 2
Iron buoy, 1
Briggs M. & Co.
Coal, tons, 400
Carey Samuel,
Grindstones, csks, 14
De Witt Wire Cloth Co.
Mdse., pkgs., 2
Erie Railway Co.
Mdse., pkgs., 14
Field Alfred & Co.
Bolts and nuts, cs., 4
Finlay H. P.
Iron roaster, box, 1
Folsom H. & D.
Arms, cs., 6
Mdse., pkgs., 4
Friedmann & Lauterjung,
Mdse., pkgs., 5
Glaenzer J. & Co.
Machine, cs., 1
Graef Cutlery Co.
Arms, cs., 4
Herrman H. & Co.
Mdse., pkgs., 30
Heuermann W.
Machinery, cs., 2
Jackson S. W. D.
Steam winch, 1
Lamarche H.
Arms, cs., 7
Maine Belt Sugar Co.
Machinery, pkgs., 9
Mason J. W. & Co.
Wire rope, coils, 3
McCoy & Co.
Mdse., pkgs., 4
Merchants' Dispatch Co.
Arms, cs., 2
Hdw., pkgs., 9
Per. caps, cs., 1
Moore's J. P. Sons,
Guns, cs., 3
Gun wads, cs., 7
Ovington Bros.
Agate ware, cs., 1
Perkins & Co.
Coal, tons, 435
Quillard A. D. & Co.
Machinery, pkge., 1
Rogers H.
Mdse., pkgs., 8
Schoverling, Daly & Gales,
Arms, cs., 27
Gun wads, cs., 3
Mdse., pkgs., 5
Schuyler, Hartley & Graham,
Mdse., pkgs., 6
Stearns John N. & Co.
Machinery, cs., 9
Thurber H. K. & F. B. & Co.
Hdw., box, 1
Wallace W.
Hdw., cs., 2
Wallace & Sons,
Machinery, cs., 10
Wetzlar, M.
Mdse., pkge., 1
Wiebusch & Hilger
Hdw. Co.
Cutlery and hdw., pkgs., 16
Witte J. G. & Co.
Mdse., pkgs., 16
Wolffe, H. & Co.
Mdse., pkgs., 3
Wolffe R. H. & Co.
Steel wire, bdls., 71
Wright Peter & Sons,
Iron and cast ware, cs., 1
Order,
Anvils, 14
Arms, cs., 11
Chain, cak's, 2
Emery stone, tons, 300
Guns and gun furniture, pkgs., 16
Gun wads, cs., 19
Hdw., bales, 11
Hdw., bdls., 71
Hdw., cs., 3
Hdw., pkgs., 279
Iron cott'n ties, bdls., 8000
Machinery, pkgs., 5

Iron.

Brown Wm.
Pig, bdls., 119
Crocker Bros.
Pig, tons, 215
Elliott, Sons & Co.
Ore, kilos., 611,980
Field Alfred & Co.
Railroad iron, bars, 1764
Fish plates, 3528
Irvine Richard & Co.
Pig, tons, 200
Lee, J. & Co.
Pig, tons, 549
Lundberg Gust,
Bars, 1178
Boxes, 584
Marvel Wm. D.
Ore, tons, 2,197½
McCoy & Co.
Bundles, 900
Milliken & Smith,
Wire rods, bdls., 380
Naylor & Co.
Bars, 2431
Spiegel., a quantity
Penn Steel Co.
Ore, tons, 580
Wall P. J.
Wire rods, pkgs, 459
Williamson Jas. & Co.
Pig, tons, 200
Order,
Bars, 69
Bundles, 290
Casks, 80
Cast iron, cs., 80
Iron, sheets, 1
Old rails and pieces, 536
Old rails, a quantity
Old rails, pcs., 3516
Old rails, tons, 200
Ore, tons, 3068
Plates, 14
Scrap, tons, 149
Sheet iron, bdls., 236
Sp'geleisen, tons, 349
Tons, 51

Steel.

Drexel, Morgan & Co.
Old rails, a lot
Naylor & Co.
Scrap steel, tons, 149
Bars, 7
Bundles, 20
Cases, 11
Tomlinson, Spring & Co.
Steel, bdls., 45
Wolff R. H. & Co.
Bundles, 35
Packages, 550
Woodford W. O.
Bars, 67
Bundles, 199
Cases, 5
Order,
Bars, 15
Bundles, 40
Cases, 12
Packages, 12
Old steel, csk., 25

Metals.

Brandeis L. & Co.
Old copper, pkgs., 2
Brown Bros. & Co.
Tin, slabs, 514
Bruce & Cook,
Tin plates, bxs., 562
Darrell & Co.
Old metal, pkgs., 71
De Rivera J. & Co.
Old cop., bbl., 1
Feuchtwanger & Co.
Manganese, tons, 12
Meyer G. A. & E.
Oxide of zinc, bbls., 150
Michelena S.
Brass, box, 1
Brass, piece, 1
Moses & Coden,
Copper, pcs., 17
Naylor & Co.
Tin plates, bxs., 7466
Phelps, Dodge & Co.
Tin plates, bxs., 11,523
Rolled brass, csks., 3
Smith J. Lee & Co.
Minium csks., 25
U. S. Stamping Co.
Tin plates, bxs., 777
Order,
Antimony, csks., 34
Lead, pigs, 771
Manganese, bbls., 24
Metals, cs., 20
Tin plates, bxs., 21,639
Tin, slabs, 5835

OLD METALS, PAPER STOCK, &c.

In the Old Metal market we note a sudden advance in prices and a fairly active demand. Fears are expressed, however, that this condition of things will not last long, as it is due principally to the scarcity of stocks, caused by the unwillingness of holders to part with theirs, in anticipation of a further rise. In the Rag and Paper Stock market we have no changes to report.

The purchasing prices offered by dealers for Old Metals are as follows:

Copper, heavy	per lb.	$0.12½	@ ....
Copper Bottoms	"	.10	@ ....
Yellow Metal	₩ lb	.08	@ .08½
Brass, heavy	"	.08	@ .08½
Brass, light	"	.07	@ ....
Composition, heavy	"	.10	@ .10½
Lead, solid	"	.03	@ .03¼
Tea Lead	"	.02¾	@ .03
Zinc	"	.02¾	@ .03
Pewter, No. 1	"	.10	@ ....
Pewter, No. 2	"	.06	@ .07
Wrought Iron	pr. cwt	.65	@ ....
Light do	"	.30	@ ....
Stove Plate	"	.30	@ ....
Machinery do	"	.50	@ ....

The prices current for Rags, &c., are as follows:

Canvas, Linen	per lb.	3 c.	@ 3½c
White Cotton, New	"	4½c.	@ ....
" " No. 2	"	1½c.	@ ....
White, No. 1	"	3¾c.	@ 4 c.
No. 2	"	2¼c.	@ 2½c
Seconds	₩ lb.	1½c.	@ ..
Mixed, Woolen	"	2 c.	@ 3 c.
Soft, do	"	8½c.	@ c.
Mixed Rags	"	2 c.	@ 3 c.
Gunny bagging	"	3 c.	@ ....
Jute butts	"	2¼c	@ ..
Kentucky bagging	"	2½c.	@ ..
Book Stock	"	2 c.	@ 2½c.
Newspapers	"	1¼c.	@ 1½c.
Waste Paper and Scraps	"	¾c.	@ ...
Kentucky Bale Rope	"	4 c.	@ ....
Tarred Shaking	"	1 c.	@ 1¼c.
Grass Rope	"	2½c.	@ ...

PHILADELPHIA.

Office of *The Iron Age*, 220 South Fourth St.
PHILADELPHIA, September 9, 1879.

Pig Iron.—The course of the market is still upward, and in some instances an advance has been established during the week of nearly $2 per ton. Pig Metal seems to be growing scarcer all the time, and buyers who hesitate find the market getting away from them with every delay. In the majority of cases parties desiring to place orders have to be satisfied with a much smaller quantity than they ask for, and even then it is regarded more as a favor than an ordinary business transaction.

At this writing buyers from far and near are asking for every description of Iron, and although producers are perfectly willing to meet the demand as far as they are able, the capacity seems to be entirely inadequate. There is a general impression that prices will go still higher, although conservative parties express the opinion that it would be for the best interests of the trade that current quotations should not be exceeded for the present. It is said that legitimate buyers have already made contracts to carry them into next year, and transactions are somewhat of a speculative character, which producers are trying to discourage. It is said that buyers could be accommodated for all legitimate requirements, but it is impossible to crowd a year's business into five or six months. There is undoubtedly some danger of the market being overdone, and that it will be overdone sooner or later there is no question whatever. The market for the present would no doubt take all the Iron that can be made here at current prices, but it is not likely that it can take the large surplus from other countries besides. Purchases of this character have been made within the past two months to what would have been regarded as an enormous amount a little while back, all of which is so much taken away from our own furnaces and mills. The improvement in foreign markets, however, seems likely to be in sympathy with our own, and it is thought that importations will be only temporary. Sales, by sample lots, in this market of foreign Iron for mill purposes, at under $20, are said to have been made to the extent of nearly 10,000 tons since date of our last report, and considerable quantities of Scotch Iron have also changed hands at about $21.50 @ $22, but higher prices are now demanded. We advance our quotations as follows: No. 1 Foundry Iron, $22.50 @ $24; No. 2, $21 @ $22; Gray Forge, $20 @ $21; Mottled, $18.50 @ $19.50; Hot-Blast Charcoal, $25 @ $28; Cold-Blast Charcoal, $32 @ $35.

Blooms—Are getting to be very scarce, and full prices are obtained when orders are accepted. We quote the market firm, as follows: Sunken Scrap Blooms (2464 lb), $39 @ $40; Northern Ore Blooms (2240 lb), $34 @ $38; best quality Charcoal Billets (2240 lb), for wire and steel purposes, $59 @ $61; Bars, do., $63.50 @ $66; Sheet Iron Blooms, cornered (2464 lb), $54 @ $56; Cold-blast Charcoal Plate Blooms, $53 @ $55; run-out Anthracite, $46 @ $48.50.

Muck Bars.—The market shows a further advance, and sales have been effected at $36.50 @ $37. Offerings are very light, and holders are unwilling to quote, except for small lots. Buyers are prepared to pay $37 @ $38, but sellers are indifferent, and $38 would probably now be an inside figure.

Structural Iron.—In sympathy with the general market, prices are unsettled and irregular, and it is difficult to quote with any degree of exactness. Manufacturers have as many orders on their books as they care to take for the present, so that buyers find it a difficult matter to get a definite quotation unless it may be for small lots. Manufacturers give the following as about the market price to-day, although it is doubtful if orders of any magnitude could be placed: Angles, 2.5¢ @ 2.7¢; Beams, Channels and Tees, 3¢ @ 3.3¢, according to specification.

Plate and Tank Iron.—A considerable amount of business has been done during the week, resulting in an advance in prices of about $5 ₩ ton. At the extreme figures there is more hesitation apparent among buyers, but holders appear to be confident of their position, and are not disposed to do business unless on their own terms. Quotations can only be regarded as nominal, but are a fair indication of the market to-day, viz.: Skelp, 2.5¢ @ 2.6¢; Sheared, 2.7¢ @ 2.8¢; Common Plate, 2.9¢; Tank and C. No. 1, 3¢ @ 3.1¢; C. H. No. 1, 3.2¢ @ 3.3¢; Flange Iron, 4.2¢ @ 4.5¢; Solid Fire-box and Best Bloom, 5.5¢ @ 6¢. A sale of Tank Iron has been made to-day, showing an advance of just 50 % as compared with price in 1878.

Sheet Iron.—A further advance of about 1-10¢ may be quoted on all descriptions, with an increasing demand and prospects of still higher figures. Manufacturers are unable to meet the demand for large lots and are confining themselves to supplying their regular trade at the current price of the day. We quote as an average of the market: Common Sheet, No. 20 to 23, 3.5¢ @ 3.6¢; No. 24 to 28, 3.7¢ @ 3.8¢; Best Refined Sheet, No. 25 to 28, 4¢ @ 4.1¢; No. 16 to 24, 3.7¢ @ 3.8¢; Best Bloom Sheets, No. 16 to 24, 5.8¢ @ 6¢; No. 25 to 28, 6.1¢ @ 6.2¢; Refined Plates or Blue Annealed, 5-16 to 16, 2.9¢ @ 3.1¢; Best Bloom, 5-16 to 16, 5.7¢ @ 5.9¢; A Patent Planished, 10½¢; B Patent Planished, 9½¢; Best Blooms, Galvanized, 30 % discount; second quality, 40 %, with extra discounts to heavy buyers.

Bar Iron.—An advance to 2.5¢ has been made by all the mills in this section, and even at the advanced rate no large orders could be placed. Manufacturers are doing the best they can to accommodate their regular customers, but they are compelled to refuse a large amount of business almost daily. The future of the trade is difficult to define; for the present, however, there is all the business that can be desired, and almost on sellers' own terms. The immediate outlook is entirely satisfactory, and there is no apparent reason to anticipate anything less favorable during the balance of the year. We quote 2.5¢ as a nominal figure, although buyers would pay more if they could get their orders taken in quantity.

Steel Rails.—There is no change to report. The mills are loaded with orders and are unable to accept anything of importance for the present. An occasional order is entered at about $50 at mill, which figure would be paid for large lots if manufacturers were in a position to accept contracts.

Iron Rails.—We have not heard of any sales of importance, although buyers are ready to place orders at current quotations; but the mills are full and not disposed to enter into extended engagements until some of their contracts are completed. The demand is quite large, and buyers could be found for many thousand tons without much effort. As remarked in our last, prices seem to have reached their limit for the present, although material is advancing. We hear of small lots changing hands at $41 @ $42 at mill for heavy sections, and $42 at tide for foreign Rails. Market steady.

Old Rails.—The market has been a little irregular and unsettled during the week, but has gained new strength within the last day or two. Some very heavy transactions are reported at prices varying from $26.25 @ $27.50, the latter figure having been paid for early delivery, and in one instance it is understood that a still higher price has been paid for a spot lot. Opinions differ as to the future, but higher figures seem to be recorded week by week, and in view of the scarcity and continued large consumption, as well as advancing prices in other departments, the immediate prospect indicates a steady market. One or two mills have shut down pending the arrival of purchases made some time ago, and others state that they will follow the market no further, but will close their mills until prices are more in accordance with the finished article. Heavy shipments are on the way, but sales to arrive seem likely to absorb supplies for some time to come. The market is bare of stock, with $27.50 offered for immediate deliveries; lots to arrive in 1880 unsettled, but held at $26.50 @ $27.

Scrap Iron.—The market is firm, and full prices are promptly realized for good selections, say cost $14.50 @ $16; Wrought, $24.50 @ $26.

Nails.—We have to report a very firm market, with $2.75 as an inside figure. The demand is not specially active, but is quite equal to the supply. Most of the mills are sold close up, and it is not likely that prices will weaken; many predict a further advance soon.

PITTSBURGH.

Office of *The Iron Age*, 77 Fourth Avenue,
PITTSBURGH, PA., September 9, 1879.

The Iron business in all its departments continues excited and unsettled, with a continued upward tendency, and the trade, without exception, have been so much surprised at the events of the past few weeks as to create considerable expectation in regard to the future. Prices have now been obtained that were not dreamed of 60 days ago, and there is considerable apprehension that the upward movement will be overdone, that it will stimulate importations, largely increase the production and create labor troubles. It should not be forgotten that the consumption, under the stimulus of railroad building and general improvement in business, has very largely increased, and it is expected, unless checked by something unforeseen at present, that it will continue large for some years to come. The indications are that the requirements of 1880 will largely exceed those of the present year. With the improvement in general business which has taken place, the market for labor has also stiffened, and the number of idle men is small as compared with this time last year.

Pig Iron.—The market continues very firm, with a demand largely in excess of the supply, and since the date of our last report there has been a further appreciation. The advance on the ordinary grades of both Mill and Foundry Iron up to the present time has been from $6 to $7 ₩ ton; and at this sharp advance there are more buyers than sellers. Holders generally are asking an advance of from $1 to $2 ₩ ton above current rates, which is not surprising in view of the course of the market for some time past; and for the same reason buyers are anxious to anticipate future wants. Some of the largest consumers have been buying almost every lot offered to them for some time past, occasionally paying an advance on current rates. Commission merchants report that the trouble just now is to find the Iron, that there is no difficulty in effecting sales, and that, too, at extreme prices. The most sanguine, who were thought wild some time ago, when they predicted that the price of good Mill Iron would go to $25, 4 mos., before the advance was arrested, are now predicting that it will go to $28, possibly $30, and this being the case it is not strange that sellers are hard to find at current rates, nor that furnacemen are refusing to contract for future delivery at anything like present quotations. That there is an actual scarcity of Pig Iron not only here and at points tributary to this market, but throughout the West, is now well known, and with a continued active demand, and a probability of the cost of production being increased, it is not strange that the upward movement in prices continues. Sales of some 6000 tons were reported during the past week at $21.50 @ $23, 4 mos., for Mill, and $23.50 @ $25 for Foundry—one lot of 200 tons of Western Red-Short, from Lake Superior ore, is said to have brought $25, cash. There is no trouble in finding buyers for ordinary grades of Mill at $22.50, cash, to $23, 4 mos. Charcoal Irons are also firm and higher, but there does not appear to be as much inquiry for them as there is for bituminous coal and coke Irons.

Bessemer Iron.—There have been no purchases here during the past week to amount to anything, the chief buyer, the Edgar Thomson Steel Rail Mill, being out of the market for the present. Sales have been made at furnaces in the Shenango and Mahoning valleys, to go West from there, at, it is said, equal to $26 @ $26.50 at furnace. The 10,000 tons of foreign Bessemer Pig, of which mention was made in our last report, will, it is said, cost $23.10, delivered free on cars in Pittsburgh.

Muck Bar—Continues in active demand, and prices, in sympathy with raw Iron, have further advanced. It is now quoted at $40

@ $42 ℔ ton, against sales ten days ago at $35 @ $36.

Manufactured Iron.—While there has been no further advance in prices during the past week, the market is firm and the last advance well maintained. The tendency continues upward, in sympathy with raw Iron, which has gone up from $1 to $2 ℔ ton since the new card for Finished Iron was adopted. Any additional advance in the latter now will be followed by an advance in the cost of puddling, and it is probable, therefore, that there will be no further change for the present, notwithstanding the increased cost of Pig. We continue to quote upon a basis of 2.50¢, 60 days, for Merchant Bars, with the usual discount of 2 % for cash.

Nails.—At a meeting of the Pittsburgh manufacturers on Saturday last it was agreed to advance prices to $3, 60 days, with an abatement of 10¢ per keg on lots of 200 kegs and upward. Wheeling advanced to $2.60, 60 days, last week, and we have no doubt that a $3 card will be adopted there within the next few days. There has been an advance of almost $1 per keg on Nails within the past 60 days, and there is no certainty that the highest notch has yet been reached; but it should be borne in mind that they were lower than any other of the Iron products. As soon as the market becomes more settled there will no doubt be a very fair business, as stocks are unusually light and an increased consumption is assured. We now quote at $3 per keg, 60 days, 2 per cent. off for cash, with the usual abatement of 10¢ per keg on lots of 200 kegs and upward.

Horse and Mule Shoes,—Shoenberger & Co. quote 100-keg lots at $3.50 and $4.50 per keg; larger lots or special lots at special rates.

Railroad Spikes—May be quoted in a jobbing way at 3¢, but it is not certain that a large lot could be bought for much less, in view of the increased cost of production.

Wrought Iron Pipe.—There is no abatement in the demand. The mills are all busy, and prices have been further advanced. We now quote discount on Gas and Steam Pipe at 42½ @ 45 %, and Boiler Tubes, 40 @ 45 %. The discount on Pipe has been reduced from 65 to 45—that is, as compared with the highest point. Oil Well Casing continues rather quiet, owing to the depressed condition of the oil business, but prices are firmer and will no doubt go higher.

Rails.—There have been, so far as we know, no sales of Steel Rails during the past week. For early delivery $50, cash, at mill, could no doubt be obtained, and the last sale for future delivery was at $48, deliverable next spring. Judging from the condition of the Bessemer Iron market, Steel Rails will have to go still higher. Old Iron Rails continue scarce, and the recent advance is well maintained. The last sales reported were at $29, but $30 is now asked. A good many old Rails are being relaid on coal roads and sidings, and they answer the purpose almost as well as new Rails, and the difference in cost, $10 @ $12 ℔ ton, is considerable of an item.

Steel.—There is a continued steady demand for all grades of Merchant Steel, and manufacturers generally are loth to accept current rates, especially for the commoner qualities, which have been ruling very low for some time past. It may appear strange that in the face of such a sharp advance in all kinds of Iron there has been no appreciation in Steel, but it should be borne in mind that the latter did not rule anything like as low as the former, and, moreover, the cost of production has not as yet been increased much, whereas that of Iron has gone up 30 @ 35 %.

Scrap.—All kinds of Scrap Iron are firmer and higher, with an increasing inquiry and light supply, and it looks as if prices would have to go still higher, in sympathy with the increased cost at sources of supply. Old Car Wheels quoted at $22.50 @ $23 per gross ton; Car Metal, $17 @ $17.50; Cast Turnings, $12 @ $12 50; Wrought Scrap, No. 1, $24.50 @ $25, net; Axle Turnings, $16.50 @ $17; Car Axles, $30; Car Springs, $30 @ $31.

Window Glass.—There is a very fair and increasing demand, and there is every indication of a good fall business. Prices, to makers, are not altogether satisfactory, but having to compete with French Glass they are timid about making an advance. We continue to quote discounts at 75 % for car-load lots, and 70&10 % in a jobbing way. Nearly all, if not all, the factories are again in operation, and it seems very much as if they will have all they can do until the 1st of next July, as stocks are very light, and we have no doubt the consumption of the present year will exceed the last one.

Coke.—There is steady demand, and notwithstanding the increased capacity, the consumption is still fully equal to the production, and prices are well maintained. We continue to quote at $1.20 @ $1.30 per ton, delivered free-in-cars at ovens. Now that so many idle furnaces have been started up, the consumption must of necessity have been considerably increased; hence, notwithstanding the large number of new ovens now in process of construction, there is no apprehension of an oversupply. The development of this important interest has been very rapid within the past few years, and there is no reason to doubt that it will continue to grow for some years to come.

Coal.—There is a very fair and increasing business, as there always is at this season of the year, and the shipments by rail continue. There have been no shipments by river since early in August, owing to the suspension of navigation, and the down-river markets are stiffening up in consequence. By the recent storm at New Orleans, some 42 boats of coal were lost, and the price there has been largely advanced in consequence. We continue to quote Lump Coal at 4¢ per bushel, delivered free on cars.

Petroleum.—This important interest continues fairly active, but prices remain very low, and there is not much prospect of any immediate improvement. The production continues heavy, the visible supply, to use a common expression, is simply immense, and any material improvement in values for the present, at least, is simply out of the question. Crude is still ranging from $65 @ $70 per bbl. for certificate and shipment. Refined has advanced at the seaboard within the past few days 6½¢ @ 6⅝¢ per gallon, but it is very evident that the margin for profit at these rates must of necessity be very small. The export movement keeps up well, and the demand for home consumption is always large during the fall.

CHATTANOOGA.

Office of *The Iron Age*, Market and 8th Sts.,
CHATTANOOGA, Sept. 8, 1879.

The activity of the Iron trade has been the salvation of business in half of the South since July 1st. The outbreak of fever and the fear of short crops from drouth were very depressing. But the steady improvement in the Iron business, the profitableness directly to mills and furnaces, the comparatively liberal wages and good prices for material, and the promptitude with which manufacturers' bills have been met—these causes have set money enough afloat and kept it afloat to preserve a reasonable life in all lines of general trade. Had this prop been as weak as it was last year, the causes mentioned must this year have brought about widespread embarrassment, if not many failures, throughout this district.

Pig Iron.—The feeling this week tends to steady the market, and we shall probably be able, in a short time, to get the bearings and furnish reliable figures. There have been no sales, because there is no Iron for sale. All the "loose" Iron was picked up by buyers during the excitement of last week. Furnacemen decline to book orders, except at rates ruling on day of shipment, which indicates very plainly the touchy condition of the market. We make no change in last week's figures: Coke Irons—No. 1 Foundry, $20 @ $23; No. 2, $17 @ $20; Gray Forge, $17 @ $18; White and Mottled, $15 @ $16. Hot-Blast Charcoal—No. 1 Foundry, extra, $22 @ $24; ditto, $20 @ $22; No. 2 Foundry, $17 @ $20; Gray Forge, $17 @ $20; White and Mottled, $16. Cold Blast Charcoal—Car Wheel Metal, $22.50 @ $27.50; do., Extra Standard, $24 @ $29; Forge, $17 @ $22.

Muck Bar, &c.—$30 @ $35.50; Old Rails, $22 @ $23; Wrought Scrap, $18 @ $20; Old Car Wheels, $19 @ $20. Old Rails and wrought scrap are very stiff at quotations, with advancing tendencies. In fact, there is none of either offering.

Ores.—Brown Hematite, 50 to 56 %; per ton, $1.75 @ $2.25. Red Fossiliferous, 50 @ 56 %; per ton, $1.20 @ $1.60. The above prices for ores delivered in Chattanooga on cars or on the wharf from flat boats.

Nails.—The market has been very buoyant. The mills have all they can do, and continue the policy of selling only on quotations ruling on day of shipment. We quote at $2.65 rates, with very light shades to purchasers of job lots.

Manufactured Iron.—The stiff and advancing tendency of the market has not been so prominent a feature as it was last week, there being no special change except in Merchant Bars, which are advanced 15¢ ℔ 100 pounds, and 25¢ ℔ 100 on Light Rail. We quote: Merchant Bars, 2.50¢; Railroad Spikes, 3¢; Light Rail, 2.50¢; Track Bolts, 3.75¢; Trestle Bolts, 4.50¢.

Coke.—We quote 10¢ per bushel for washed foundry. Furnace, full supply, at $2 per ton, free on cars at Chattanooga or South Pittsburg.

Coal.—There is no change in the market nor in prices. We quote run of mine, free on cars in Chattanooga, at $1.25 @ $1.75 ℔ ton. Lump, as per quality, 10¢ @ 12¢ ℔ bushel.

Pig Lead—5¢; Ingot Copper, 18¢.

Iron Rails.—The mill here is full of orders for some months to come. Orders at less than $42 @ $44 ℔ ton would not be considered at all, nor at these rates except for future delivery, say late in the fall.

Steel Rails.—We quote at $47 at mill, with short supply.

BOSTON.

SEPTEMBER 6.—*Pig* is firm at quotations, and it is the general belief that the limit of advance has been reached. The shipping port rates at the close are $22 @ $23 for No. 1 X; $20 @ $21 for No. 2 X; $19 @ $20 for Gray Forge, and $17 for White and Mottled. Freights to Boston, $1.30. Spot lots of Pig Iron are scarce and firm at $24 @ $25 for No. 1 X and $22.50 @ $23.50 for No. 2 X. *Old Rails* are quoted at $26 @ $28. Sales have been made the past week at the latter figure, probably for prompt and near-by delivery. The market will undoubtedly be largely supplied soon, as sales are reported in England of 67,000 tons for shipment to America. *Copper* meets with no change, and store prices are steady at 16¾¢ @ 17¢. Large lots to arrive are available at 16¼¢. There is continued upward tendency in Sheet Iron. We quote Boston store prices: 3¼¢ @ 3½¢ for Nos. 12 to 18, 3½¢ @ 4¢ for Nos. 20 to 24 and 3¾¢ @ 4½¢ for Nos. 25 to 26; 4¼¢ @ 5¢ for Refined; 7½¢ @ 8¢ for Galvanized, Nos. 14 to 20; 8¼¢ @ 11¼¢ for do., Nos. 21 to 28; 13¢ for Russia, perfect, and ½¢ less for do. No. 1 stained. *Tin* is quoted at higher figures, and considerable excitement prevails in the market. Tin Plate is moving upward with other articles, though no actual advance has yet been established. We quote carload lots of Straits Pig at 16½¢ @ 16¼¢, and smaller lots as below. We quote: Straits, 17¢ @ 18¢; Banca, 20¢ @ 21¢; English L. & F., 16½¢ @ 17½¢. We quote Plate Charcoal I. C., $6.50 @ $7; Coke, $5.50 @ $6, and Charcoal Terne, $6.25 @ $7.75. *Lead* is still in light demand, and with a slight tendency toward lower prices. Large lots of Pig are quoted at 4.25¢. Small lots of Pig from store are firm at 4½¢ @ 5¢. *Sheet Zinc* has again advanced and meets with quick sales at 8¢ @ 9¢.—*Commercial Bulletin.*

CINCINNATI.

Messrs. E. L. HARPER & Co., under date of Sept. 6, write as follows: The market has been very firm, and has stiffened up considerably. Hanging Rock Irons, while not beyond the prices quoted last week, are ranging decidedly more toward outside figures. In other grades the improvement is much more decided. Coke and Stonecoal Foundry Irons have developed an advance of $1 per ton. Buyers have been inclined to hold off, and the market opened rather quiet, but toward the close of the week consumers apparently concluded there was no prospect of a break in prices, but rather the reverse, and the market closes with another period of great activity in all grades. This steady advance realized in every order does not curtail the demand, but apparently increases the eagerness of the buyers. Car Wheel and Malleable Irons are rapidly stiffening. The furnace claims this grade being peculiarly exempt from foreign competition, and being still much lower proportionally than Hot-blast Iron, will certainly undergo a decided improvement in the immediate future. At the close the market is very buoyant, sellers generally holding off, and Iron of all grades being scarce. In consequence the quotations below are, to a great extent, nominal, and no large amounts could be purchased at these figures:

HOT-BLAST FOUNDRY.	
Hanging Rock C. C., No. 1	$28.00 @ 30.00
" C. C., No. 2	26.00 @ 27.00
Virginia Coke	None offering.
Shawnee S. C.	"
Hocking Valley S. C.	"
Alice Coke, No. 1	27.00 @ 27 50
" No. 2	25.00 @ 26.00
Southern Coke No. 1	26.00 @ 27.00
" No. 2	24.50 @ 25.50
Ohio Stone Coal, No. 1	24.00 @ 25.00
" " No. 2	21.00 @ 23.00
FORGE IRONS.	
Hanging Rock, No. 1 C. C.	25.00 @ 26.00
" Coke	None offering.
Longdale, No. 1 Coke	"
S. P., No. 1 Coke	"
Red Short, No. 1 Coke	"
Cold-Short, No. 1	23.00 @ 24.00
Old Rails, prime	None offering.
Strong Neutral No. 1 Coke	@ ....
Southern Charcoal	None offering.
" Coke	"
CAR WHEEL AND MALLEABLE.	
Hanging Rock C. B.	35.00 @ 36.00
Southern and Western Brands	31.00 @ 33 00
Lake Superior	28.00 @ 30 00
Peckham's Patent C. C. Refined Steel Blooms	55.00 @ ....
Peckham's Pat. C. C. Refined Double Hammered Flange Blooms	60.00 @ ....

BALTIMORE.

Messrs. R. C. HOFFMAN & Co., Iron and Commission Merchants, No. 23 South Frederick street, report the Pig Iron market as follows, under date of Sept. 8: The demand for Iron continues active, and prices advancing. We quote present prices as follows:

Baltimore Charcoal Wheel Iron	$27.00 @ 29.00
Virginia " "	28.00 @ 30.00
Anthracite No. 1	22.00 @ 23.00
" No. 2	21.00 @ 22.00
" No. 3	20.00 @ 21.00
" Mottled and White	17.00 @ 18.00
Charcoal, C. B. Blooms	53.00 @ 55.00
" " Billets	58.00 @ 62.50
Refined Blooms	45.00 @ 50.00

RICHMOND.

Mr. ASA SNYDER, Iron Merchant and Furnace Agent, writes as follows under date of Sept. 8: This market continues firm, and prices advancing. Demand far in excess of supply.

American Scotch Pig Iron	$.... @ 23.50
Anthracite, No. 1	22.50 @ 23.50
" No. 2	21.50 @ 22.50
" No. 3	18.50 @ 20.00
" Mottled and White	17.00 @ 18.00
Coke, No. 1	..... @ .....
" No. 2	..... @ .....
Va. Cold-blast Charcoal, Cold-short	24.00 @ 25.00
Va. " " Neutral	29.00 @ 30.00
Va. Warm-blast " Red-short	..... @ .....
Old Rails	24.50 @ 25.50
Old Dominion Iron Nails, per keg	2.75 @ ....
Wrought Scrap No. 1	19.00 @ 20.00
Cast " (machinery)	17.00 @ 18.00
Richmond Refined Bar Iron	2½c. @ ....

Freights to Philadelphia, $1.90 per ton of 2240 lbs. by sail.

Mr. W. N. WYETH, Iron and Steel Merchant, 46 and 48 South Charles street, reports us the following, under date of Sept. 8: Trade for the past week has ruled very active. Refined Bars have again advanced, and we now quote same firm at 2 5-10¢ to 2 6-10¢ for ordinary sizes:

Ref. Bar Iron, 1 to 6 by ⅜ to 1 ℔ ₪					2 5-10 @	2 6-10¢
" " 1 to 4½ by 1½ to 2 ℔ ₪					2 5-10 @	2 6-10¢
" " ¾ to 9, Round and Square					2 5-10 @	2 6-10¢
Hoop Iron, 1½ wide and upward					" 3 @	3¼¢
Band Iron, from 1¼ to 4 in. wide					" 2¾ @	3 ¢
Horse-shoe Iron					" 3 @	3½¢
Norway Nail Rods					" 4¾ @	5¼¢
Black Diamond Cast Steel					" 12½ @	13 ¢
Machinery Steel					" 7 @	8 ¢
Cast Spring Steel					" 6 @	6¾¢
Homogeneous Steel Plate					" 6½ @	7 ¢
Common Horse Nails					" 10 @	14 ¢
R. R. Spikes, 5½x9-16					2¾¢ @	3 ¢
Perkins' Horse shoes, ℔ keg of 100 lbs.						$3.62½
" Mule shoes						4.62½
	10	9	8	7	6	
Putnam Horse Nails ℔ ₪	18	19	20	21	23¢	
Globe Horse Nails ℔ ₪	18	19	20	21	23¢	

Less list discount to the trade.

LOUISVILLE.

Messrs. GEO. H. HULL & Co., under date of Sept. 7, write us as follows: The market is quiet but very firm in tone, and prices have advanced fully $2 per ton since our last report. No large amount could be bought at present quotations. Nearly all sales are now made for cash, though we still quote on a 4 mos. basis.

FOUNDRY IRONS.	
No. 1 Hanging Rock, Charcoal	$29.00 @ 31.00
No. 2 "	28.00 @ 29.00
No. 1 Southern, Charcoal	28.00 @ 29.00
No. 2 "	27.00 @ 28.00
No. 1 Hanging Rock, Stonecoal and Coke	28.00 @ 29.00
No. 2 Hanging Rock, Stonecoal and Coke	27.00 @ 28.00
No. 1 Southern, Stonecoal and Coke	27.00 @ 28.00
No. 2 " "	26.00 @ 27.00
"American Scotch"	25.00 @ 27.00
Silver Gray	24.00 @ 25.00
MILL IRONS.	
No. 1 Charcoal, Cold-short and Neut'l.	26.00 @ 27.00
No. 1 Stonecoal and Coke, Cold-short and Neutral	24.00 @ 25.00
No. 2 Stonecoal and Coke, Cold-short and Neutral	23.00 @ 24.00
No. 1 Missouri and Indiana Red-short	26.00 @ 27.00
White and Mottled, Cold-short and Neutral	18.00 @ 19.00
CAR WHEEL AND MALLEABLE IRONS.	
Hanging Rock, Cold-blast	32.00 @ 35.00
Alabama and Georgia, Cold-blast	30.00 @ 32.00
Kentucky, Cold-blast	30.00 @ 35.00

W. B. BELKNAP & Co., Iron and Hardware Merchants, Nos. 113 and 115 West Main street, under date of Sept. 8, write as follows: The market is strongly in favor of the sellers, all kinds of iron being held very firm, and orders are easily obtained without any concession to buyers. Sheet Iron still leads the van, the advance in some sizes having been as high as $20 per ton. Telegram from Pittsburgh this morning advises us that the card rate of Nails there has been established at 3¢, but as the market is more dependent on Wheeling and the lower mills we shall await their action before making new prices here. The demand seems remarkably well distributed for all sorts of supplies, and our hardware merchants are kept as busy as could be desired. So rapid an advance has not an unqualified blessing. It works great hardship to contractors, particularly to mechanics, whose lack of capital and acquaintance with market indications prevents the anticipation of wants. There are a number of cases in our own city of unfortunate ones who are caught short on the rise. Coopers, foundries and architectural works have all to bear their share of the burden. Advices from the South point to an increased prosperity in the Iron regions there. More furnaces are gone into blast and new ones being finished, the output of which has been engaged a long way ahead. An error in punctuation last week put us in the attitude of prognosticators. We were advancing the opinions of some old iron makers and not our own in predicting a long-continued era of better prices. We, however, firmly believe in them.

Our English Letter.

Review of the British Iron, Steel, Metal and Hardware Trades.

(*From our Regular Correspondent.*)

LONDON, ENG., Aug. 25, 1879.

THE TRADE REVIVAL

actually begins to wear the semblance of a fact fairly on the road to accomplishment. We are indisposed to accept it as being the real genuine article, but rather feel inclined to think that it is some dodge which is being played off upon us from your versatile and ingenious nation. In all sober seriousness we do not know whether trade is really improving or the contrary. There have been so many spurts of a minor nature accompanied by warmly uttered prophecies of better things to come, which have never come to fruition, or indeed struggled through the earliest stages of incubation—that we are on this occasion resolute in being tardy to accept the assurances proffered to us. We hear a great deal of talk on all sides about the numerous inquiries, the probable conclusion of contracts, the anticipated additional requirements of this, that and the other country, the certainty that quotations cannot go any lower, *et id hoc genus omne, but* (confound these *buts*) a close and searching analysis unfortunately reveals the fact that there is so far a good deal more smoke than fire. That there is a certain amount of change nobody can dispute, but when one settles down to the thankless task of separating surmise and conjecture from sober facts, the outcome of the investigation is not wholly inspiriting. I am not now referring to the nail trade, to which I will presently refer apart from the general subject, but to the iron and steel trades as a whole. As regards the smelting departments, I am of opinion there is a slight general increased activity, which has no doubt been induced by the extra foreign and American demand for pig iron, which has lately been experienced in Scotland and Cleveland, together with the reports current as to a very large sale of hematite pigs having been made by a couple of West Coast (Cumberland) houses to purchasers within your territory. These reports and statements, beyond and in addition to the actual business known and undoubted, have caused the smelters to assume a little more spirit in the conduct of their transactions with merchants and consumers, and in most instances have tended to bring about an advance of about 1/ ℔ ton. This strengthening of the market is good *per se*, but its effect may (I don't say *will*) be shortlived, for the simple reason that as things now are there are more furnaces out than are blowing, so that with any marked rise in figures, there is sure to be a great increase in the output, especially in Staffordshire and the South Wales district. The course of matters is certainly firm at present, but I don't think it is possible for anybody to state with any precision how things may stand a month hence. Should the current good demand from your side be well sustained, we may see a great jump in the iron trade of this country, and may find ourselves well on the road to activity before half of us awake to a full consciousness of that interesting fact. Then, again, the finished iron business of the whole of this country is, without exception, remarkably quiet, save as regards a few orders from the colonies, from the government, and from South America for sheets and hoops. There appears to be absolutely no call for bars and the numerous odd rolled sections which go to make up the aggregate output of the large works. Galvanized sheets, it is true, have recently sold freely, owing to the anticipation that the advance of 20/ per ton might not be the full extent of the rise resulting from the renewed dearness of spelter, but the demand has fallen off, and buyers are holding fast for the reaction which they hold must come about so soon as the combination, headed by the Belgian Vielle Montagne Company, to uphold zinc shall have achieved its deserved downfall. For hoops, too, there is a statement that 2000 tons have been sold at 5/ per ton over recent rates to United States buyers, with the additional report that inquiries for cotton ties are also afloat. I am told that the order for hoops has been taken by a North Staffordshire house at about £7. 5/, but I cannot speak to the fact from my own knowledge, nor am I enabled to assert that the transaction has made the general market any firmer. For plates there is a fairly good call in Cleveland, but there is no disposition to order large lots of iron plates so long as steel can be had in any quantity at pretty much the same price.

THE RAIL MILLS

of this country are, I believe, at the present time busier than at any previous period during the past four years. I don't go so far as to assert that they are making a vast amount of money, but I can state that they are making more rails, so that there is, at all events, the old rattle of the machinery, even if the pennies don't make a great noise. The most considerable order recently given out is that of the Canadian government for their Pacific line. There has been a good deal of newspaper paragraphing and so forth about this order, but I happen to know that the "square facts" in connection with it are that one of the Ministry now (or but recently) in London, let a tender for 15,000 tons, through a London and Dundee house, on such extremely low terms that he decided to place orders for a much larger quantity, spreading deliveries over this and the early portion of next year. The total quantity thus purchased was 65,000 tons, of which 30,000 tons went to the Barrow Hematite Iron and Steel Company, Limited, Barrow-in-Furness; 15,000 tons to Brown, Bayley & Dixon, Limited, Sheffield; 10,000 tons to the West Cumberland Iron and Steel Company, Limited, Workington; and 10,000 tons to the Dowlais Iron and Steel Company, Limited, Dowlais. The prices paid are excessively low—so bare, indeed, that some doubts are expressed as to the possibility of any profit being made. In the case of Brown, Bayley & Dixon, for instance, a portion of the order is to be delivered this year at £4. 15/, and the remainder next year at £4. 19/ per ton, ex ship, at Montreal. Assuming (and the assumption involves a reproduction of actual figures) that the railway, &c., charges from Sheffield to Liverpool and the f. o. b. payments are 9/6 per ton, and the freight, with insurance thence to Montreal, another 8/—total, 17/6—it is pretty clear that the price per ton at the works will not be more than £3. 17/6 for this year's, or £4 per ton for next year's lots. At the same time, I am quite willing to believe that Mr. Holland can see his way to *some* clearance on the transaction, or he would not have committed himself to the work. There are those who aver that loss is inevitable at such extraordinary prices, but nowadays I don't think anything is capable of astonishing one. The other concerns named will naturally clear more on these orders, for the simple reason that, being on or near the seaboard, they avoid inland carriage on materials and the outward charges on finished goods. Just now I believe the Steel Company of Scotland are running on rails for Ireland and Scotland; Bolckow Vaughan's on Russian, Italian and Spanish orders; Barrow is at work night and day for Canada, Italy and Russia; Moss Bay for Italy, Spain, &c.; the West Cumberland for Canada and Russia; Steel, Tozer & Hampton for home lines; Brown, Bayley & Dixon for Russia, Canada and home lines; Wilson & Cammell for home lines, India and Russia; John Brown & Co., nil (!); Charles Cammell & Co. for Russia; Samuel Fox & Co., nil (!); Ebbw Vale for the States, Brazil, New Zealand, &c.; Dowlais for Canada, Italy, Spain, Brazil and the States; Rhymney for the States and various. The last three works are very busily engaged on iron rails for your lines, under contracts ranging from £4 to £4. 10/ for delivery at Philadelphia, New York, New Orleans, &c., prior to October 1st next. The aggregate purchases of these rails is large, and it is a singular feature in this connection that more money has been paid for them than for steel! The quantity of steel rails recently ordered by Russia is very large, probably 50,000 to 60,000 tons, but deliveries are deferred in some cases. These particulars render good my assertion that the British mills have rarely been busier than they now are, the only exceptions being at those works where the old-fashioned plant has not been adapted to the exigencies of recent competition by bringing the mills near to the converters, and by doing away with all intermediate processes between the original melting and the finished rail.

THE WINDING UP

of the Furness Iron and Steel Company is announced, which has four blast furnaces at Askham, near Barrow-in-Furness. The newspapers speak of this as a "failure," but I rather take it to be a sort of friendly arrangement, under which, I understand, the manager of the company has his salary of £1500 per annum continued, and Mr. J. T. Smith, managing director of the Barrow Company, gets £500 a year as liquidator until such time as the voluntary winding up is completed. This doesn't appear to be "much of a failure, anyhow"—to quote one of your humorists.

THE BRITISH ASSOCIATION

opened its annual session last week. The chosen town this year is Sheffield, which appears to have done great things in point of contributions, good arrangements, feeding and excursions. The bad weather—incessant rain—has upset the last named, but, on the whole, the gathering has been successful, and several of the papers have been rather over than under the average. The presidential address of Prof. Allman, although purely and entirely devoted to biological subjects, was of great interest, dealing, as it did, with matters which must command the absorbed attention of every educated person. The mathematical and minor sections had their usual entertainment, and in the mechanical section papers were presented by well-known writers, of which you will doubtless take some notice in due course. In the geographical section the hero of the hour was naturally the Portuguese African explorer, Major Serpa Pinto. The major did not read his own paper, however, but was so worried by the audience that he had perforce to "rise to the occasion," and "say his piece"—which merely consisted of an anecdote of one of his adventures in the South African bush.

SCOTCH PIG IRON

has advanced on the whole, but there are daily fluctuations, caused by the ardor and energy with which the "bulls and bears" of the Glasgow Exchange are throwing themselves into the novel delights of speculation. According to John S. Swan & Son (Limited), Glasgow, there are now 295,641 tons of pig in Connal's stores, against 191,494 tons this date last year, an increase during last week of 3845 tons. The total increase of shipments to date this year is 60,587 tons, mostly foreign. Messrs. Swan quote ballast pig 37/6 per ton, and their general quotations

for makers' brands are pretty closly in accord with those appended. There are now 89 Scotch furnaces blowing (as compared with 96 a year ago) out of 154 built; of the total, 91 are old style and 73 gas furnaces. Writing from Glasgow, August 23, James Watson & Co. said: "On Monday the market for Scotch Pig Iron opened very strong, with a large business done from 44/ @ 43/9, cash, and on Tuesday the price further relapsed to 43/4½, which was the closing figure of the previous week. On Wednesday the market opened firm at 43/7½, cash, afterwards declining to 43/ per ton, while yesterday a large business was done from 42/9 @ 42/6, improving, however, to 42/10, at which buyers remained at the close. To-day there has been considerable animation, with a moderate business done from 43/ @ 43/3½ per ton, closing buyers at 43/3, sellers at 43/4½ per ton. The shipments last week were 8652 tons, as compared with 6162 tons for the corresponding week of 1878." We quote:

	No. 1.	No. 3.
G. M. B., at Glasgow	43/6	42/
Gartsherrie, "	47/	43/9
Coltness, "	53/	43/9
Summerlee, "	45/6	42/9
Langloan, "	50/	43/
Carnbroe, "	45/6	42/6
Calder, at Port Dundas	47/	42/6
Glengarnock, at Ardrossan	45/6	43/
Eglinton, "	44/	42/9
Dalmellington, "	43/3	42/3
Shotts, at Leith	47/6	44/

IN CLEVELAND

the state of the market is more hopeful, especially in view of the circumstance that a cablegram has been received (it is said) at Stockton-on-Tees from the United States for 2000 tons of Cleveland pig iron. I am not inclined to give this statement unquestioned credit, but if true I foresee trouble with your common pig smelters. In Cleveland common forge numbers can almost be given away—and there is practically no limit whatever to the quantity attainable. Already a lot of 200 tons has been sent from West Hartlepool to Boston as a test shipment. The one item of interest from this Northern field just now is the cheery report of the Consett Iron Company, showing a profit of £55,935 on the year's operations—a remarkable result, when it is borne in mind that Consett, although the largest plate works in the North, does not raise, but buys, its own ore. As things have been of late, it has paid to buy ore rather than work the mines. Bolckow Vaughan's are trying to secure another reduction of wages. Their men are under notices. They are now rolling 2000 tons of Cleveland steel (Thomas-Gilchrist process) into rails for the North-eastern Company.

SHEFFIELD

is not lively in any degree, and the chronicler of small beer and the snapper up of unconsidered trifles must inevitably have a rather easy time of it. The visit of the British Association has distracted local attention, but there is no disguising the fact that there is and has for some time been a great deal of anxiety among those who are largely mixed up with the staple trades of the town and district. The favorable change now just apparent will, it is hoped, move matters around to a remunerative point of the compass, otherwise we may not improbably hear of troublous tidings. I don't hear of any great change in the average state of industry in Steelopolis, save as regards the rail orders already detailed. There are more orders for hardwares and cutlery, but the aggregate quantities sent off are not large, albeit more considerable than they were a month or six weeks ago.

THE WIGAN COAL AND IRON COMPANY,

one of the largest concerns in Lancashire, having its own coal, blast furnaces, iron mines in Algeria (Messelmoun), and other advantages, has made a profit of £13,183 only during the past year, but inasmuch as there was £17,128 standing to the debit of the profit and loss account, the net result is £3944 "to the bad." The magnitude of the concern is evidenced by the circumstance that the amount debited to plant and works is £1,512,991.

STAFFORDSHIRE AND BIRMINGHAM

are quiet as regards iron, and there is no feature of any note to record in connection with them except the few items alluded to in my summarized remarks above. In the hardware branches, on the other hand, there are numerous changes and movements of one kind or other afloat. In the gun trade there is reported to be a strong call for birding kinds from the United States at about 50/ each here, or 70/ in your port. There is also stated to be a not inconsiderable amount of work done in steel barrels for your military rifles, while it appears that we get our barrels from Liège. There is now a Servian contract for rifles in the market, and all the gun people are after it like a pack of hounds after a fox. In the edge tool trade of Wolverhampton a dispute exists, owing to an attempt on the part of the employers to resist the spreading from Birmingham and Wednesbury of an absurd old custom of paying the "platers," or rough workers, £10 a year, or 10 per cent. bonus, for "house rent"—an observance instituted many years ago, at a time when the platers' hammers were worked by water power, and when the workpeople were required to reside close to the factories, so that their services might be utilized at any moment. The absurdity of the thing becomes apparent when it is stated that they have never at any time used water power! The masters will probably lose the fight this time.

Sanders Brothers' circular, dated London, August 15th, says:

COPPER.

Soon after our last issue the Chili charters for the second half of July were advised, viz., 2800 tons, on which prices fell to £53 for good ordinary brands; this limit induced some speculation in addition to general demand, and prices have improved again to the point we last closed at. Consumers generally complain of want of orders for manufactured goods, but the amount of business doing in raw copper is good, and prices are certainly tempting. The gross totals on the 1st inst. were 57,032 tons, against 54,819 tons on the 1st ult. Manufactured copper is in better demand, after fluctuating with other sorts as above. Australian copper is steady. Wallaroo, £62; Burra, £61.10/.

SPIEGELEISEN

£4. 7/6 for 20 per cent. English f. o. b. tidewater, in moderate demand. Ferro-manganese unchanged since our last, prices being steady, with a fair amount of business passing.

LEAD.

Our present quotations are: WB, £15; LB, £14; ordinary brands, £13/15. Lead is better in price and easier of sale, partaking of the improvement which has attacked most of our articles.

REGULUS OF ANTIMONY

£47. 10/, compared with £49 same date last year; steady and in fair request both for home and export.

TIN.

Our quotations to-day are: English, L. & F. ingots, £67; English bars in barrels, £68; English refined, £69; Straits, £67. 10/; Australian, £67. 10/. A considerable improvement has taken place since our last in the price of Tin, and the market for the time being has a strong aspect. It seems that a rather large amount of speculation has been induced lately, and this fact, rather than any statistical improvement in the article, may be taken as the basis of the movement above referred to. At the same time it will be observed that total figures are reduced somewhat, and it is a feature worthy of note that during the past few months the deliveries of Straits and Australian have largely exceeded the shipments. English Tin has moved in sympathy with foreign and is to-day quoted £67 for L. & F. Ingots.

SPELTER.

Ordinary Silesian, £17. 10/ compared with £18 same date last year. After falling steadily for months, inducing injudicious "bearing" by those who ought to have known the market, Spelter has suddenly risen over £3 ₱ ton, owing to combination and judicious purchases by Continental producers, who having the market in hand will doubtless keep prices steady for the winter.

TIN PLATES.

I. C. Coke, ordinary brands, 16/ @ 16/3; I. C. Coke, best brands, 17/6 @ 18/; I. C. Charcoal, ordinary brands, 18/ @ 19/; I. C. Charcoal, best brands, 19/6 @ 20/. Just after our last, with a dull market and little demand, "makers" met and decided to rearrange the scale of wages, a month's notice of which was given at the majority of the mills. The "men" have also met, and deploring with their "masters" the present position, wish the latter to redeem the trade by "restricting the make." They, however, give practical effect to their wishes by deciding "that each mill by working 12 hours shall only do 36 boxes per turn, and "30 boxes per eight hours, and that in no case the tin-house men shall exceed 30 boxes per day," and are at present carrying this out. They also resolve "to co-operate with their employers for the mutual benefit of masters and men." It is not improbable that the masters don't see it quite in the same light, and have raised the wind to reap they don't know what, but it promises to interfere with production partially, even though the questions involved are settled amicably, while, should a strike occur, the limitation will be greater, though it seems unlikely that masters will agree so unanimously as to cause anything like total cessation, even in this latter case. The present effect of this is a desire to buy something for quick delivery to be able to look on with more equanimity later, and prices have hardened 1/ @ 1/6 per box in ordinary cokes, and about 1/ for all other sorts. For ordinary brands of coke tin of the oil grade 16/ per box is now the figure generally asked. Charcoal tins are obtainable at 18/ @ 18/6 for ½ by specification grade of Allaway R. G., and best brands at 20/ @ 21/. Ternes, both charcoal and coke, are in comparatively quiet demand, quotations for the former ranging between 17/ and 17/6 for 14 x 20, and 35/ and 36/ for 28 x 20, according to brands, and for the latter between 14/3 and 14/9 for 14 x 20.

FREIGHTS.

To New York, from the Clyde, steam or sail, 2/6; Liverpool, steam, 5/ & 10%; sail, 4/ & 5%; London, steam, 10/ & 10%; sail, 5/ & 5%. To Boston, Clyde, steam or sail, 9/; Liverpool, steam, 3/6; London, steam, 15/ 10%; sail, 10/ & 5%. To Philadelphia, Clyde, steam or sail, 7/6; Liverpool, steam, 5/; sail 5/ & 5%; London, sail, 7/6 & 5%. To Baltimore, Clyde, steam or sail, 8/; Liverpool, steam, 7/6 & 10%; sail, 6/ & 5%. To New Orleans, steam or sail, 5/; Liverpool, steam, 7/6 & 10%. To Portland, Liverpool, steam, 10/ & 10%. To Montreal, Liverpool, steam, 7/. To Halifax, Liverpool, steam, 15/ & 10%.

FOREIGN.

FRANCE.

(*Moniteur des Interets Materie's.*)

PARIS, Aug 24, 1879.—*Metals.*—Business matters have been proceeding favorably here; there is indeed now as much activity displayed in building and manufacturing as at any time previously this year. *Copper.*—There has been quite an improvement of between 2.25 and 5.25 francs in this city, and we now quote Chili Bars, 145 @ 146; Ingots and Slabs, 151.50; Best Selected, 152.75, and pure Corocoro Ore, 150. Havre is quiet and steady at 143.75 @ 147.50 for Chili Bars. Marseilles is firm and rising. They quote small Refined Ingots, 157 francs the 100 kilos.; Sheet Copper and Yellow Metal Sheathing, 170; Copper Bolts, 180, and Sheathing Copper, 175. *Tin.*—Quite an improvement is noticeable, with a rise of 4 to 9 francs. We now quote Banca, 180: Billiton, 177; Straits and Australian, 179, and English, 172.50. There is great firmness at Marseilles, and a rise of 5 francs in Banca Tin. They quote Banca, 180; Straits, 170, and English and French, 175. *Lead* has followed the general upward movement in metals, rising 1 @ 1.50 francs. The quotation at Paris is 35.50 @ 36.50; Manufactures, 49. Spanish is quoted 35.50 @ 36 at Havre. An extraordinary degree of firmness prevails at Marseilles, where the smelters refuse to sell and have not even appeared at the government adjudication for 580 tons for the army, for which Spanish Lead has been bought at 43.45. The advance in New York and the short supply there has helped the European amelioration very materially. Soft at Marseilles commands 34; Antimony, 32, and Manufactures sell from 37.50 @ 38 francs. *Spelter.*—There has been no interruption in the upward tendency in France and we now quote Silesian, 45.50 @ 46.50, and Sheet Zinc, 60 francs. Havre, on the other hand, has declined 50 cents, closing at 38.50 @ 39. Marseilles remains firm and improving, and Sheet Zinc has advanced 4 to 5 francs. They quote the latter 56 @ 57, and Old Remelted, 25 francs. *Iron.*—The market here has been rather more quiet, which is due merely to the vacations and to the previous activity, now followed by a temporary lull. The tendency, nevertheless, remains as favorable as heretofore, and will soon develop into a brisk fall demand. We feel confident, in view of the generally favorable business prospects. Flooring Sheet Iron has remained steady at 18 francs, but we hear that several rolling mills are starting an increased supply, leading to the presumption that a slight giving way may be one of the probabilities. In the North and the Ardennes this has been discounted, and they now offer it at 16.50 francs there. In the Muerthe and Moselle, Affinage Pig Iron is selling for near delivery at 54. In the Haute Marne there is some demand developing for Sheet Iron, Hollow-ware, Stoves, Hardware and Machinery, to the neglect of heavy Iron, Nails and Chains. At the North there is an uninterrupted activity in the Maubeuge and Valenciennes basins. The works are literally loaded down with commands, and are only sorry that they cannot attend to them all at once. Merchant Iron commands, in that locality, 16.50; Common Flooring, 17.50; Large, 20.50; Sheet Iron, 20.50 @ 24.50; Puddled Sheets, 21.50 @ 23.50; and Boiler Iron, 24.50. A government adjudication for Iron canal lock doors has come off at Nantes, the job being carried off by the works of Messrs. Baudet, Donon & Co., of Argenteuil, at a 33 per cent. discount, beating the three great rival concerns—the Fives-Lille, the Creusot and the Cail—whose discount ranged between 12 and 26 per cent. In the Var the Menpenti Works are turning out some big engines for the ironclad steam frigate, the Admiral Duperre, of 8000-horse-power, the vessel to run 14 knots. *Coal.*—There is great apathy still in the French Coal markets, but, as the dull season is now fast drawing to a close, all may confidently look forward to a revival.

BELGIUM.

(*Revue Universelle.*)

BRUSSELS, Aug. 24, 1879.—*Iron.*—There continues to be a good run of orders, which go in preference to such works as are known to have improved their machinery while the dull years lasted. Prices are not very remunerative, and fortunes are not being made, but the feeling is much more hopeful than it has been at any time since 1873. Specialties, as is usually the case, of course form an exception, and pay well to manufacture whenever they chance to be in request. The large rolling mills in Belgium, in view of their superior capacity to turn out work, have adopted the principle of contenting themselves with diminutive profits, and upon this basis certainly do a brisk trade. This, again, enables the consumers of raw Iron to work on very reasonable terms, and the result is a steadily growing liveliness. The government has hardly got its rolling stock for State railroads when it is in the market again for 121 railway cars of different kinds and shapes. The Meuse works are just building a 200-horse-power pumping machine for the Jaen (Spain) coal mines; this engine is a so-called Kley patent machine. We merely mention this because hitherto the orders for similar machinery for Spain have invariably been filled in England. At Charleroi things are picking up mightily, the demand being for all imaginable kinds of Iron. This keeps up in that locality a steady amount of briskness, and the rolling mills in particular have as much work as they can conveniently take charge of. The demand for Pig Iron is also satisfactory; the stocks at the blast furnaces are fast running low, and the firmness in Scotland sustains prices. Add to this the growing speculation, the activity in forming new companies in the metal and coal lines, and we may well assert that a new era is dawning upon us. *Coal* remains low on account of present abundance.

GERMANY.

(*Borsenhalle.*)

HAMBURG, Aug. 23, 1879.—*Metals.*—Trade in the metal and other lines in Germany is now developing, even while we are still in summer, much faster than was generally supposed would be the case but a short time since. The fact is that speculation has been started again, first in England and Holland, subsequently at Paris, and now spreading to Central Europe. This speculative mania, especially at Paris in the founding of new anonymous societies, is suddenly assuming unlooked-for proportions, and the contagion will no doubt soon gain Berlin and Vienna, to be sooner or later followed by the same disappointments which were experienced in 1873. At least this will be the case after money, now a drug, gets to command 5 @ 8.70 once more. *Copper* has been picking up, but slowly. We quote in this market Drontheim, 64 marks the 50 kilos: Minnesota, 80; Hecla, 68; and Tough Cake, 62 @ 64. Berlin is steady at 62 @ 64 for English and Australian, and 63.50 @ 64 for Mansfeld. *Tin.*—Stocks in this country have run low, and a replenishing process has begun. We quote here Banca, 72 @ 72.50; English, 69 @ 70 for Common, and 71 @ 72 for Refined. *Lead.*—The amount of Lead placed upon the German markets is unusually small, and as there is a good consumptive demand, the course of prices remains favorable to the users. Berlin is steady at 14.25 @ 14.50 for Tarnowitz, Hartz and Saxonian. We are firm here and moderately active at the following rates: English Pig, 15 @ 15.50; do. Manufactures, 16 @ 16.50; German Pig, 14 @ 14.50, and Spanish 18.50 for choice brands. *Spelter.*—There is great scarcity and corresponding firmness at the improvement lately established. Berlin quotes Silesian, 18 @ 19.50; Breslau Silesian Union, 17.30; P. H., 17.15; W. H., 17.45; Lodulla, 17.15. We are nominally 17.50 @ 18 marks here.

HOLLAND.

(*Koch & Vlierboom.*)

ROTTERDAM, August 24, 1879.—*Tin.*—The advance mentioned in our last has made further progress. Banca reached 40.50 guilders, and is held at 40.75, while Billiton has advanced to 40 guilders the 50 kilos.

The Fall River Strike.—The spinners have published a second appeal to the workingmen of America for aid. The appeal gives a comparative statement of the print cloth market for several years with the present market, and argues that now no country can compete with America for the home trade, and alleges that the foreign demand for American goods was never so strong as at present. It refers to the spinners' offers of arbitration, and asks why, if their cause is not just, the manufacturers should be unwilling to arbitrate. The appeal concludes as follows: We have made the second proposal for arbitration, after being on a strike for over ten weeks, and again refused. There is nothing left for us now but to fight this battle to the bitter end. If we lose, it will be for want of ammunition. This is not a struggle for the interests of the Fall River spinners alone, but one which interests the whole of the toiling masses of this country. Only let all the workingmen and working women in the country do their duty by contributing a few cents per week, and we will ultimately come out of this struggle with victory perched upon our banner. Every workshop throughout the country should take steps for the formation of committees at once, and a system be adopted for the collection every pay day. This work should be commenced earnestly, energetically, and at once. The battle for us has been hard and long; still we have journeyed on, relying upon the generosity of our fellow men and women all over the land. Although we feel footsore and tired, it would be pitiable to succumb for want of substantial aid, which we kindly ask may still further be rendered.

A reporter for *The Iron Age* lately sat on an old rusty boiler at the foot of Eighth street, East River, with Mr. John Roach at his side, and in the varied conversation which ensued, was told of a notable exploit in forging a steamboat shaft. The reporter was then escorted to the adjacent pier, where there lay an enormous shaft for the steamer St. John, of the People's Line to Albany, just turned out from the works. This shaft was 37½ feet long and 20 inches average diameter, weighing 40,000 pounds, and had been made from blooms. The whole job was executed in six days—the forging, turning and finishing—and for dispatch this is believed to be without an equal in New York. Mr. Roach mentioned, in addition, that within the last eight months no less than 19,000 tons of steam shipping, all of iron, had been turned out from his establishments in Chester and New York. From these facts, the inference is drawn that New York has facilities for doing her full share of work on any large contracts which may come from Russia or elsewhere, especially as the works referred to, even in their present state, have not been taxed anywhere near their full capacity.

New Steam Line to the Mediterranean.—A new line of steamships between America and Europe will soon be in operation. Philadelphia will be the western port, whence the steamers will make monthly departures for Barcelona, Marseilles, Genoa and Naples, and are expected to touch at Messina on the return trip. E. A. Quintard, the European agent of the Philadelphia and Reading Railway Company, sailed in the Adriatic on Thursday, the 4th instant, to make arrangements for the pioneer steamships of the new line, and was accompanied by John L. Howard, the supervising engineer of the same company. The line is to be started with English steamers of about 3500 tons burthen, but it is intended to replace them with American steamers at an early date. The outward cargoes will be of coal and other products of American industry, while the return freights will consist of the usual materials of a Mediterranean cargo for America. It is quite possible that the ships will touch at New York on their return trips. They will not—for the present, at any rate—be fitted for carrying cabin passengers, but will have ample accommodations for steerage passengers from Naples and Genoa.

The largest bridge in Europe will be completed next year. It will cross the Volga in the government of Samara, Russia, on the Siberian Railroad. The river at the point of crossing is four miles wide in the spring and 4732 feet wide in the autumn. The cost of the bridge will be $3,500,000. Twelve piers, 85 feet high, at a distance of every 364 feet, will support the structure.

INDUSTRIAL ITEMS.

CONNECTICUT.

At present there are eight furnaces making exclusively Salisbury iron—three at Canaan, one at Lime Rock, one at Huntsville, one at Sharon Valley, one at Cornwall Bridge and one at Millerton, and their combined product is 100 tons daily. The ore is obtained from the Old Hill, Davis and Chatfield mines, in the town of Salisbury. The first blast furnace in this region, and it is supposed the first in the State of Connecticut, was built in the year 1762, by Ethan Allen, of Ticonderoga fame, in what is now known as the village of Lakeville. The history of this furnace has been an eventful one; during the revolution it furnished cannon, balls and shell for the provisional government, and during the war of 1812 the Salisbury cannon was still in use. This furnace continued to exist until 1810.

MASSACHUSETTS.

The John Russell Cutlery Co., of Turners Falls, are running extra hours and are filling large orders.

The Lowell Boiler Works are now being operated by Richard Dobbins, and never had so much work on hand as at the present time. They are now building several 80-horse-power boilers for the corporations in Lowell and other places, and are also engaged in the manufacture of boilers for private dwellings and public buildings, with several improved patents introduced.

The great test of turbine wheels, which was to have begun at Helyoke last Monday, the 1st instant, has been postponed to accommodate parties from distant States who did not decide to enter in time to get here. It will probably not come off now for two weeks or more, and ample notice will be given. Some 30 applications have been made from all parts of the country. The test will be in charge of W. E. Werden, of the American Society of Civil Engineers.

The Ames Mfg. Co., of Chicopee, are very busy in their galvanizing department, a branch of business lately added to their already numerous lines of manufacture.

The factory property of Gardner Aldrich, situated on the south side of the Charles River at Watertown, is to be occupied as a needle manufactory. We understand that some 75 hands will be employed.

NEW YORK.

The two Onondaga furnaces at Geddes have been thoroughly repaired, and a new hot blast added to each. No. 1 has been put in on a contract for mill iron; No. 2 on fuel iron.

The Columbia Furnace at Hudson, which was recently put out of blast, has been repaired. The stoves have been transferred from the top to the bottom of the stack, the furnace raised higher and a bell and hopper added.

The Ulster Iron Works at Saugerties have resumed work after usual stoppage for repairs during hot weather.

NEW JERSEY.

The potteries, rolling mill, wire mills and chain shops at Trenton are now doing a lively business, and the prospect is that it will continue during the fall and winter.

At Phillipsburg, the largest iron manufacturing town in Western New Jersey, about 1000 men find employment in the mills alone. The Warren Foundry, which six months ago was running on short time with not 100 men at work, is now employing over 400 men, besides having introduced new machinery which does away with the employment of many men.

The Phœnix Lock Works, Newark, have been doing a successful and prosperous business for the past five years, and the demand for their goods keeps them running at full capacity.

The manufacture of building and fire-brick, in which James R. Sayre, Jr. & Co., Newark, are extensively engaged, is more brisk than for many years, the improved condition of the iron industries making the demand for fire-brick especially large.

Lowerre & Tucker, Newark, are driving their factory to its utmost capacity to fill the extensive and constantly increasing demand for the Mrs. Knox No. 99 Crown Jewel and Eureka fluting machines. Their business is reported doubled in volume the past year.

PENNSYLVANIA.

The statement that Messrs. Kaufman & Eckert, of Reading, are to have charge of the Emaus Furnace is premature, as such an arrangement has only been spoken of. The movements of the above gentlemen depend upon the future owners of this property. The foreclosure or sale cannot take place for about two months, and it is somewhat uncertain who the future owners will be.

Business at Laufman & Co.'s mill, at Apollo, is very good, and the demand for their sheet iron for show cards, signs, &c., is altogether for consumption. This firm take contracts for as many as 100,000 sheets at one order.

The report that the Dunbar Furnace Co. have begun the construction of a new blast furnace adjoining their old one, is premature. They expect, however, to have a new furnace at Dunbar by the commencement of next year, but nothing has been done upon it yet.

The Hamburg Rolling Mill, at Hamburg, has been leased by the Philadelphia and Reading Railroad Company to Mr. Langhorne Wister, of Philadelphia, formerly of Duncannon. It will be started about the middle of September for the manufacture of muck bar and bar iron.

There is an effort on foot to reorganize and put in operation the mill and furnace of John Roach, at Chester, and it is expected that matters will be so arranged that the mill will start up before long. All the mills in the vicinity of Chester, with one exception, are running to their full capacity, and there seems to be a scarcity of puddlers.

The old Erie Rolling Mill Company, at Erie, no longer exists, all the property belonging to that company, together with the blast furnaces at Sharpsville, being owned and operated by the Mount Hickory Iron Company, Limited, with headquarters at Erie.

The Mount Hickory Iron Company Limited, of Erie, have purchased from the Buffalo Iron and Nail Company some of the machinery offered for sale last June by that company. Among the purchases were a very heavy steam shears, a portion of an 18-inch train, and a universal mill complete. Also, a complete set of Lewis' patent angle rolls for 15-inch train, with all the appliances for making angle irons of ordinary sizes. A portion of this machinery is already set up in the rolling mill of this company, and the design is to bring it all into use at the convenience of the company.

The puddling department of the Lochiel Rolling Mill, at Harrisburg, is being put into operation to make puddled iron for market.

One hundred men will be employed at the Wrightsville, Lancaster County, Furnace, which will resume operations in about a week.

The Phœnix Iron Company and the Edgemoor Iron Company, of Philadelphia, have a contract for bridge work from Demarara, British Guiana, amounting to $175,000—an increase of $25,000 over the original order.

Application having been made to the Philadelphia and Reading Railroad Company to lease the Bechtelsville Furnace, Wm. Lorenz, chief engineer, H. Nichols, resident engineer, Pottsville, and P. L. Weimer, of Lebanon, have gone to inspect the furnace and ascertain what repairs and improvements will be necessary preparatory to leasing it.

The Weimer Machine Works, at Lebanon, are running full on blast furnace orders, and never in their business experience have that firm found so much difficulty in finishing their contracted work. During the month of August they have refitted and started the following furnaces: Topton Furnace, Topton, Berks County—weekly capacity, 250 tons; Chester Furnace—weekly capacity, 175 tons; Monocacy Furnace, Monocacy, Berks County, 200 tons production; Lyons Furnace No. 1—weekly output, 175 tons; Lebanon Valley Furnace, Lebanon, making 24 tons daily. This firm is busily engaged rebuilding the Henry Clay Furnace No. 1, at Reading. This furnace went out of blast last week. The Lyons No. 2 furnace will go into blast about Sept. 15, and the Kutztown Furnace will blow in about the same time. The Messrs. Weimer are hard at work on the Pottstown Iron Company's furnace, and as new engines, boilers and hot-blast stoves are required, several months will be consumed in the completion of these furnaces. They expect to finish rebuilding the Port Carbon Furnace in three months. They are also building for W. D. Wood & Co., of Pittsburgh, a pair of blowing engines, and for the Spring Lake Iron Company, of Michigan, a large charcoal furnace blowing engine. They are preparing plans for a new charcoal furnace for Messrs. Hunter & Springer, at Chambersburg; also for a pair of similar furnaces for West Virginia, and for remodeling the three furnaces at Phœnixville.

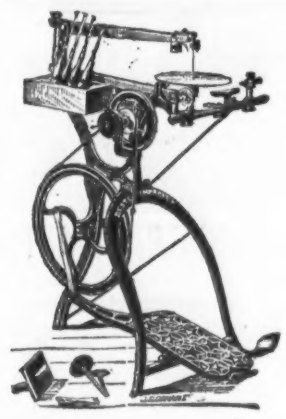
The stove foundries of Philadelphia have plenty of orders.

The Thorndale Iron Works, Chester, have orders ahead for a year. They are running night and day.

Three hundred and seventy tons of pig iron were manufactured at the blast furnace of the Warwick Iron Company for the week ending Saturday, the 30th ult.

The railroad sidings are blocked with cars of Spanish ores that are being shipped to Altoona.

Two 4000 lb. hammers are being erected in the Eames Petroleum Iron Works, Titusville, and will soon be in operation. These works are the first ever built expressly for oil fuel, and not a pound of coal will be used in the mill. The following comparative analysis, made by Prof. Henry Wurtz, at his



The demand for Scroll Saws has become so large that most Hardware dealers are getting in the way of keeping them.

The trade commences in early fall and lasts all winter, thus helping business in the dullest season. There is probably not a Hardware store in the land but that could sell some of these goods.

We are headquarters for hand and foot-power Saws, Saw Blades, Wood, Designs and all things pertaining to this business. The Lester Saw at $8 and Rogers Saw at $3 are now in universal demand. The Lester Saw consists of a Scroll Saw, Circular Saw, Drilling Attachment, Emery Wheel, Dust Blower, Turning Lathe and Tools, extra Saw Blades, Drill Points, Designs, Screw Driver, Wrench, &c. It has been greatly improved since last year, and is a very perfect machine. The Rogers Saw consists of a Scroll Saw, Drilling Attachment, Dust Blower, Designs, Drill Points, Saw Blades, Wrench, &c. The Saws are nicely boxed, without extra charge. We warrant them in all respects. They give dealers no trouble.

MILLERS FALLS CO.,

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Q. S. BACKUS,

Sole Manufacturer of the

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Bit Braces,

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Straight

Extensions,

&c.

Comprising every grade of quality and finish, from the cheapest Farmers' Brace to the finest Steel Sweep heavily nickel plated, with rose-wood handles and lignum vitæ heads, being the most complete line offered by any manufacturer in the country, and which for simplicity of construction and effectiveness have no equal. Catalogues and price lists furnished upon application at office and salesroom,

No. 102 Chambers Street, NEW YORK.

THE TURNER & SEYMOUR MFG. CO.,

MANUFACTURERS OF

Upholsterers', Stationers', House Furnishing and Fancy Hardware

AND NOTIONS.

Fancy Brass Goods and Iron Castings to Order.

Picture Nails, Knobs and Hooks, in great Variety, Gilt and Tinned Picture Wire, Twisted and Braided.

American Cast Shears,

Sold by Hardware and Notion Dealers everywhere.

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PORTABLE DRILLS. Driven by power in any direction.
RADIAL DRILLS. Self-feed--Large Adjustable Box Table.
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MULTIPLE DRILLS. 2 to 20 Spindles.
HORIZONTAL BORING AND DRILLING MACHINES.
HAND DRILLS. CAR BOX DRILLS.
SPECIAL DRILLS. For Special Work.

NATIONAL STEAM PUMP.

Adapted to every possible Duty.

Send for Illustrated Catalogue.

WM. E. KELLY,

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BURR & CO.,

Manufacturers of Waterman and Russel's

Patent Iron Strapped Blocks.

Also, Manufacturers of

ROPE STRAPPED BLOCKS.

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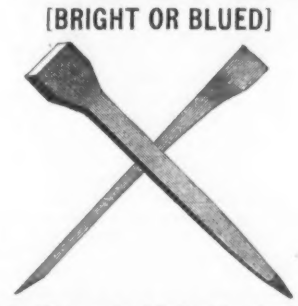

These nails are made of the best brands of **NORWAY IRON,** and are guaranteed to be equal to any in the market.

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East Haverhill, - New Hampshire,

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Factories at Haverhill and East Haverhill, N. H., and Evansville and Westmore, Vt.

Genuine OLD RELIABLE,
INDIAN POND (Red Ends),
LETOILE,
LA MOILLE,
DIAMOND GRIT,
UNION,
WHITE MOUNTAIN,
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GREEN MOUNTAIN,
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Stones gotten up and labeled in any style desired.
PRICE and QUALITY GUARANTEED.
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THOMAS W. SPARKS,

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SPARKS'

American Chilled Shot,

Rivaling the English and all Others.

STANDARD DROP & BUCK SHOT AND BAR LEAD.

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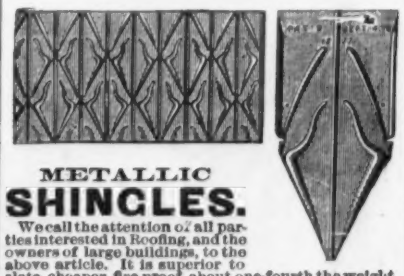

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SHINGLES.

We call the attention of all parties interested in Roofing, and the owners of large buildings, to the above article. It is superior to slate, cheaper, fire proof, about one-fourth the weight, lays much closer, therefore is storm proof, cannot crack, &c. Any carpenter can put them on. Send for description and Price List to **Iron Clad Manufacturing Co.,** 50 Greenpoint Av., Brooklyn, E. D. P. O. Box, 2528, N. Y. City.

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TURKEY WING GRAIN CRADLES, 4, 5 and 6 fingers.
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All of a superior quality. None genuine unless marked *Grant Fan Mill and Cradle Co.* Send for illustrated catalogue and price list.

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SCALES

AND TESTING MACHINES

Patent "Self-Adjusting" Railroad Track Scales, pronounced "the most accurate and durable" over all competitors at World's Fair, 1876. In use by Pennsylvania, Lehigh Valley, Baltimore and Ohio, and other Railroads. Patent Coal and Hay Scales. Warehouse and Platform Scales and Scales for all purposes. Machines for testing materials, all sizes. Works, 9th st., at Master; Store, 52 S. 4th st., Phila. New York Office, 91 Liberty Street.

BOILERS, ENGINES AND TANKS FOR SALE at LESLIE BOILER WORKS, Pearl, near Greene St., Jersey City. Repairs promptly attended.

Established in 1839. Formerly L. & A. G. Coes.

L. COES & CO.

Manufacturers of L. Coes'

GENUINE IMPROVED AND MECHANICS

Patent Screw Wrenches

UNDER PATENTS DATED

JUNE 26, 1866,
MARCH 23, 1869,
REISSUED 1870.

NOVEMBER 10, 1863,
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REISSUED JUNE 1, 1869,
IMPROVED AUG. 1, 1877.

The back thrust when in use borne by the SHANK instead of the Handle.

None genuine unless stamped "L. COES & CO."

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Light, Durable, Impervious.

WHITE STONE IRON WARE

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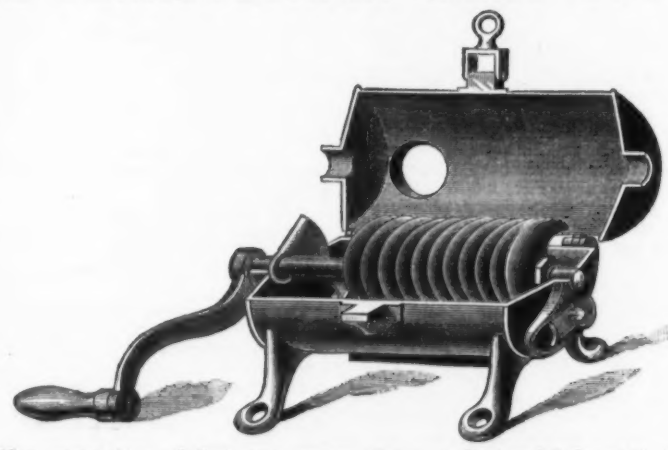
THE LAST DISCOVERY IN ENAMELS.

Every desired quality secured in connection with a brilliant white finish, a thing never achieved before. Handsome as stone china. Admired universally, and to-day without a rival.

For samples and catalogue address the manufacturers,

708, 710, 712 N. 2d Street, St. Louis, Mo.

THE PENNSYLVANIA MEAT CUTTER



Has the capacity of Cutters upon the market which cost 60 per cent. more money.

PRICE LIST.

No. 1, containing 8 Steel Knives.....per dozen, $24.00
No. 2, " 11 " ..... " 28.00
No. 3, " 12 " ..... " 36.00

Nos. 1 and 2 are packed ½ dozen in a box; No. 3 packed ¼ dozen in box.

Discount to the trade 30 and 10 per cent. Orders solicited.

LLOYD, SUPPLEE & WALTON, Philadelphia.

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THE SWIFT MILL.

ESTABLISHED 1845.

The annexed cut shows one of the many styles of Coffee Mills of our manufacture, especially adapted to Grocers' use and all retailers of coffee. They are highly ornamental, and workmanship of the very best. We make more than 30 styles.

ALSO LANE'S PORTABLE COFFEE ROASTER

Will roast 30 to 40 lbs. at once, and can be used as a stove at other times. Send for descriptive list to Manufacturers.

LANE BROS., Millbrook, N. Y.

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Our agents, Graham & Haines, 113 Chambers St., New York, carry a full line of our goods, and will be pleased to serve you at factory prices.

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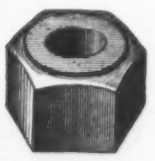

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Of every description, at lowest cash prices. Also,

All Styles Nuts, Washers, Ferrules and Brass Goods Generally.

PLUMBERS' AND GAS FITTERS' SUPPLIES A SPECIALTY.

The privilege of estimating on special articles solicited.

private laboratory at Hoboken, N. J., will show the relative merits of the "Benzon" brand of Norway iron and metal welded from common scrap by the Eames oil fuel process. The first column gives the metal designed as "Norway iron," "Benzon brand;" the second, the metal welded from common scrap by the Eames oil fuel process:

Iron	98.247	98.140
Manganese	.939	1.206
Carbon	.150	.129
Silicon	.198	.175
Phosphorus	.120	.094
Sulphur	.041	.031
Slag	.315	.225
Total	100.000	100 000

Prof. Wurtz, in submitting the analysis to the Titusville parties, says in conclusion: "In the process of solution of the petroleum iron in *iodine* to separate the carbon, there were found present minute disseminated particles, derived from the original scrap, which were so highly phosphuretted that they would not dissolve in that agent These are to be regarded in the light of mechanically mixed impurities, like the slag, for example, and do not affect the inherent qualities of the homogeneous mass of the metal. They prove that if the scrap had been picked over and the more impure pieces thrown out, the analysis would have given a better result, particularly in the phosphorus. Nevertheless, the general result is rather better in all points for the iron from the oil-welded scrap than for the 'Benzon' brand of iron."

PHILADELPHIA AND VICINITY.

Henry Disston & Sons' business has been remarkably active, and the manufacture of saws and files pushed to the utmost summer limit. It will take a month to clear the file from orders as it now stands. Business has never been so good with them since the panic; in fact, since 1st of last July they have had all they could do to get the goods out of the place. Their works are now running about five days a week (Saturday being usually taken as a holiday), and give work to between 800 and 900 hands. They have lately sent a lot of first-class hand saws and files to Barcelona, Spain, and a similar invoice to London, England. Their direct trade with Australia they consider the most valuable, as Australian buyers insist upon having everything of first quality. The exhibit of the firm at the approaching exhibition in that country will be one of its great features. Among the out of the way places in which this firm have established themselves is Tiflis, in Caucasia, near Mount Ararat, where they send yearly increasing lots of first-class goods. They export crosscut saws to Russia, and are in receipt of orders from small houses in Sheffield, England, for their first-class articles.

Messrs. G. & H. Barnett, file manufacturers, say they are very busy. They have a great many orders in hand, have just shipped a heavy lot to San Francisco, and expect to deal largely with the Pacific coast. They are not aware of the full extent of their foreign trade, as most, if not all, of their orders come through jobbers, but large quantities of their goods go to South America. The firm employ over 100 hands, and turn out on an average 300 dozen files a day.

McCaffrey & Bro., Pennsylvania File Works, are employing more hands at present than at any time during the seventeen years of their existence. Since the close of the Paris Exhibition the above firm have had considerable inquiry from the other side for their goods. Within a few weeks they have dispatched samples to Brazil, where they feel confident of being able to meet the European goods.

The D. K. Miller Lock Company have been very busy of late. They have developed a large foreign trade with South America, England, France, Germany and Australia. Their patent padlock is now in general use by post offices, express companies, banks, &c. The New York elevated railroads employ them exclusively. The company do not employ a large number of hands, for with their various and complete machinery, locks can be turned out in large quantities with few men.

Messrs. Hillebrand & Wolf, manufacturers of locks, report that they have been remarkably busy for some time past, and complain that they cannot get goods out fast enough. The great demand with them seems to be for trunk locks, as they are much pushed in that line. Their foreign trade is chiefly with Germany, though they have just shipped a general assortment to Havana, Cuba, and have a rapidly increasing Pacific trade. The bulk of their goods, however, are used nearer home. The Scandinavian lock is a specialty with them.

Kimball & Kimball, band-saw machines, Philadelphia, are full of orders, and unable to manufacture rapidly enough to meet the current demand. They are consequently obliged to increase their capacity by building new machinery. Every mail brings inquiries from foreign countries. They intend to make a display at the approaching Australian exhibition.

The Philadelphia Screw Company state that their business has increased in a remarkable manner, and that they cannot fill orders, though they have doubled their capacity within the last year, and expect to double it again before six months are passed. The company has been in existence about a year and a half, during which time they have turned out screws of a superior quality, averaging 800 gross per day. They employ some 70 hands, and are a strictly conservative firm, building their own machinery and keeping their own secrets. As regards foreign trade, they have numerous inquiries from England, Germany and other countries, but have enough to do to supply the home demand.

Messrs. Townsend, Wilson & Hubbard, bolt manufacturers, have been for some time past decidedly pushed, trade being more than usually active. They report having orders for three months in advance, and consider the outlook in their line extremely favorable. This firm is at present giving employment to some 75 hands. They consider prices to be quite high enough, and do not expect much of an advance.

The Enterprise Mfg. Co. report a steadily improving business, with an increasing demand for their leading specialties. The demand for sausage stuffers and meat cutters is expected to be very heavy this fall. They are running full time with their usual force of hands.

At the Coleman Eagle Bolt Works business is more active than ever known before, employing more hands and turning out larger quantities of goods. Although prices are improving, with a prospect of a more decided advance soon, they are at present too low to yield a fair margin for manufacturing. They have a large number of orders on hand and could fill up with work for the next six months, but prefer taking orders as they come.

The American Machine Company, manufacturers of fluting, wringing and plaiting machines, report that they have been and are now doing a satisfactory business, being obliged during a part of last month to run overtime. They find that prices are stiffening, owing to the advance in all kinds of material. The company, finding their present premises too limited, are about to erect extensive buildings on a recently purchased lot of land in the northern part of the city.

In the heavier branches of business, such as in locomotives, railway tools and machinery, the condition of affairs is all that can be desired. Men employed nearly equal the number previous to the panic, while the output is much greater in proportion. Shipbuilding is not specially active, although there is reason to anticipate something important at an early date. Messrs. Roach & Son, Chester, Pa., turned out steamships with an aggregate tonnage of 17,000 tons during the first 7 months of the year, but there is no special activity at the moment.

The Henry Disston & Sons File Company, Limited, have recently enlarged their works at Tacony by the addition of new buildings and machinery. The works now occupy three sides of a square, and are arranged to facilitate the systematic handling of the work from one process to another, so that the steel is now received at one end of the works, and passing in regular order through the processes of forging, annealing, grinding, cutting, hardening, &c., the finished files are delivered at the other end without any unnecessary handling. In the file works are employed about 150 hands, and they turn out from 500 to 600 dozen files a day. They have recently adopted and now employ a newly-invented and ingenious method for sharpening or whetting the teeth of files after they are hardened, which consists of a process of liquid grinding that gives a degree of sharpness to the teeth. This process is used only by the Disston File Company and one other manufactory, and is said to be the most valuable improvement that has been made since files were first known.

Lovegrove & Co., Philadelphia, have just received an order from Japan for two steam engines. They have also recently shipped to Australia and Russia, and find a growing demand for small power engines for export.

PITTSBURGH AND VICINITY.

Messrs. Hussey, Howe & Co. have made contracts for a quantity of knife steel, to produce which will employ one mill constantly.

The middle roll in the blooming mill of the Edgar Thomson Steel Works, weighing 7000 pounds, broke down on Saturday, the 6th instant.

The Pittsburgh Steel Casting Company have just made three large spur wheels for the Cambria Iron Company, each wheel 7 feet in diameter and 15 inches face, and weighing over 6000 pounds. These are the largest steel castings ever made in this country. They were made entirely of crucible steel, without a pound of cast iron in the mixture.

Anderson & Co.'s steel works are running three sets of hands and are pushed to fill orders.

Emerson, Smith & Co., Beaver Falls, have just put up a very complicated piece of machinery, of their own make, for milling their patent planer tooth saws. It does the work perfectly.

OHIO.

We are informed that Mr. Thomas Means, of Portsmouth, last week refused an offer of $30,000 for 1000 tons No. 1 Hanging Rock iron.

Himrod Furnace No. 2, Youngstown, blew in on Monday, the 1st, having blown out for repairs last June. The Pollock furnace at Brier Hill blew in on Sunday morning, the 31st ult., after standing idle since 1872.

The Cleveland Co Operative Stove Company have just completed the extensions and improvements to their works on Garden street, at the junction of the C. and P. railway, which have been in progress for some time past. These extensions make their foundry one of the largest and most complete in the State.

The Niles *Independent* says: William Ward & Co.'s old furnace has been purchased by a party of eight persons of that place for $8000, and preparations are being made to put it in blast at once.

Hocking *Sentinel*, 21st: A corporation of iron men, embracing all the furnacemen of the Hocking and Straitsville district, was organized week before last. J. R. Bucktel, of Bessemer, is president, and W. Craft, of Craft's, is secretary; R. D. McManigal, of Logan, general superintendent.

The Cleveland *Trade Review* says: Pig iron has advanced $4 and bar iron $10 since the present boom commenced. In fact, pig iron that was sold at $16 last month, cannot be bought now for $20.

MISSOURI.

Four cars of pig lead and two cars of white lead—one of the latter for New York and the other for Chicago—were sent out on Friday, the 5th inst., by the Lone Elm Co.

The White Lead Co., of Joplin, recently shipped to Lewis Bros., of Philadelphia, a car load of blue lead, which is to be used in the manufacture of india rubber. It is pronounced a very superior article for this purpose, and it is quite probable that a large proportion of the lead will soon be shipped East in a blue state, or, rather, before it has gone through the whitening process.

The Granby Co., of Lone Elm, has 150,000 pounds of mineral on hand, and three eyes are run steadily at the smelter.

The zinc trade still holds its own. There has been no change in price within the past few weeks, but the demand is probably greater than a month ago. Guengerich is still buying and shipping two cars per day, which he gathers up at Carthage, Webb City, Joplin and Short Creek—wherever he can get it. His shipments are all made over the Gulf road via Kansas City.—*Joplin Mining News.*

The West Joplin Lead and Zinc Company have 800,000 pounds of mineral on hand, with receipts continuing in excess of the smelting capacity of their works.

Lanyon & Co., the New Pittsburg zinc manufacturers, have within the past few months sold more spelter than any other manufacturers in the United States. Their spelter ranks with the best in the market.

MICHIGAN.

The Spring Lake Iron Company is the name of a new Milwaukee organization, with headquarters at Spring Lake, near Fruitport, 8 miles from Grand Haven, Mich. This company has commenced operations by putting down the foundation for a new charcoal furnace at the point named. The materials to be used are a part of one of the stacks formerly in service at Milwaukee. The principal office of the company will be at Milwaukee, with a branch office at Chicago. The work is vigorously progressing, and it is expected that the furnace, which is to produce a No. 1 charcoal iron, will be ready to blow in early in the coming winter.

TENNESSEE.

The Oakdale Iron Works' furnace will probably go into blast within the next 60 days. The following are the officers of this company: President and superintendent, John G. Scott, Webster, Roane County; vice-president, Pierre Chouteau, St. Louis, Mo.; secretary and treasurer, E. C. Lackland, St. Louis; assistant secretary and treasurer, D. A. Carpenter, Knoxville.

The Iron Age Directory

and Index to Advertisements.

B. KREISCHER & SONS,

FIRE BRICK.

BEST AND CHEAPEST.

Established 1845.

Office, foot of Houston Street, East River, NEW YORK.

NEWTON & CO.,

Successor to

PALMER, NEWTON & CO.,

ALBANY, N. Y., Manufacturers of

FIRE BRICK

Stove Linings,

Range and Heater Linings

Cylinder Brick, &c., &c.

M. D. Valentine & Bro

Manufacturers of

FIRE BRICK

And Furnace Blocks

DRAIN PIPE & LAND TILE.

Woodbridge, - - - N. J.

PERTH AMBOY TERRA COTTA CO.,

Successors to

A. HALL & SONS, Perth Amboy, N. J.,

ARCHITECTURAL TERRA COTTA

AND

FIRE BRICK.

170 Broadway, NEW YORK.

Brooklyn Clay Retort

AND

FIRE BRICK WORKS.

Manufacturers of Clay Retorts, Fire Bricks, Gas House and other Tile, Cupola Brick, &c. Dealers in and Miners of Fire Clay and Fire Sand. Clay bank at Burt's Creek, New Jersey. Manufactory: Van Dyke, Elizabeth, Richards and Partition Sts., Brooklyn, N. Y. Office No. 86 Van Dyke St.

Watson Fire Brick Manufactory

ESTABLISHED 1836.

JOHN R. WATSON, Perth Amboy, New Jersey.

Manufacturer of

FIRE BRICK,

For Rolling Mills, Blast Furnaces, Foundries, Gas Works, Lime Kilns, Tanneries, Boiler and Grate Setting, Glass Works, &c.

FIRE CLAYS, FIRE SAND, AND KAOLIN FOR SALE.

HENRY MAURER,

Proprietor of the

Excelsior Fire Brick & Clay Retort Works,

Manufacturer of FIRE BRICK, HOLLOW BRICK AND CLAY RETORTS.

WORKS PERTH AMBOY, NEW JERSEY

Office & Depot: 418 to 422 East 23d St., N. Y

TROY FIRE BRICK WORKS

Troy, N. Y.,

JAMES OSTRANDER & SON,

ESTABLISHED 1848,

Manufacturers of

FIRE BRICK,

Tuyeres, Tiles, Blast Furnace Blocks, etc. Miners and Dealers in Woodbridge Fire Clay and Sand, and Staten Island Kaolin.

Established 1864.

GARDNER BROTHERS,

MANUFACTURERS OF

STANDARD SAVAGE

Fire Brick, Tile & Furnace Blocks,

OF ALL SHAPES AND SIZES.

Clay Gas Retorts and Retort Settings,

AND

Miners and Shippers of Fire Clay.

OFFICE: 376 Penn Ave., Pittsburgh, Pa.

WORKS: Mt. Savage Junction, Md., and Lockport, Pa

BORGNER & O'BRIEN,

Manufacturers of

Fire Bricks,

Clay Gas Retorts,

Retort Settings,

Tiles, Blocks, &c., &c.

23d St., below Vine,

PHILADELPHIA.

Eighteen years' practical experience.

CYRUS BORGNER. WM. J. O'BRIEN

MILLER'S BRICK PRESSES

(Established 1844),

FIRE and RED BRICK,

And Brickmakers' Tools in General.

SAML. P. MILLER & SON,

309 South 5th St., Philadelphia.

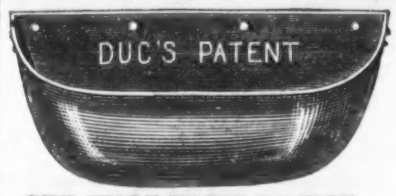
W. & J. TIEBOUT,

Manufacturers of

Brass, Galvanized & Ship Chandlery Hardware,

No. 290 Pearl Street, New York.

DUC'S IMPROVED ELEVATOR BUCKET.



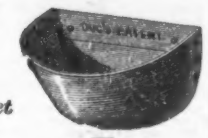
THE STORE-HOUSE BUCKET.
(Partial straight front.)
In 12 in., 14 in., 16 in. and 17 in. Sizes.

Made of Best Charcoal Stamping Iron.

No Corners to Catch.

Light Running and Very Durable.

The only Scientifically Constructed Elevator Bucket in the Market.



The MILL BUCKET.
In 3½ in. to 10 in. Sizes.

T. F. ROWLAND,

Sole Manufacturer,

CONTINENTAL WORKS, Brooklyn, E. D., N. Y.

Send for Circular.

NICHOLSON FILE CO.,

Manufacturers of

FILES AND RASPS.

ALSO

Filers' Tools & Specialties.

Manufactory and Offices at Providence, R. I.

The following space will be used in illustrating our specialties, the matter being changed weekly.

IMPORTANT.

Our Mill Saw Files undoubtedly stand in the estimation of mill men as the best article ever put upon the American Market, having almost entirely displaced the foreign article. And why? Because they are made from the best of material and with a care and determination to make a better article than can be found elsewhere: and **it is our firm intention to continue them at the head,** and to make any and every variety of files used upon the different kinds of saws.

Our Double Cut Files, for work and endurance, as proved by our Automatic (Self-Recording) Testing Machine, will outlast any hand-cut file we can find. In filing mill saws, in almost every case the duty of a file is measureable, and hence *quality will always tell.* Is it so with the double cut? Is it not more often used for a few moments, and then thrown into a drawer or on to the bench with hammers, chisels and other tools—bruised a little—used a little—and bruised a little again—until, when a sharp file is wanted, it is useless for the purpose. And thus in most cases (unlike the *Mill File*) no comparative test has been obtained—and a greater opportunity for the exercise of prejudice left open.

The double cut files of our make have *all* the irregularities in the hight and spacing of their teeth that true economy calls for, and for actual service are really a superior file.

Our Racer Horse Rasps, and **Double Ender Sawfiles** and Handle, are both destined to take the lead, and to stand beside our other Files. They have the *points* and *real merit,* which will *tell* in the long run.

If Extra Sharp Teeth or a *superior brass file* is wanted for any purpose, try the "*Gritty Liquid Whetting Process.*"

Don't Be Deceived by those who talk Hand Cut Files! Most of them are to-day introducing machinery as fast as they *know how,* and can find the means to do it with.

G. W. Bradley's Edge Tools.

Butchers' Cleavers,
Butchers' Choppers,
Axes and Hatchets,
Grub Hoes and Mattocks,
Mill Picks,
Box Chisels and Scrapers,
Ring Bush Hooks,
Ax Eye Bush Hooks,
Socket Bush Hooks,
Watt's Ship Carpenters' Tools,
Carpenters' Drawing Knives,
Coopers' and Turpentine Tools.

FOR SALE BY

MARTIN DOSCHER, Agent, 96 Chambers Street, N. Y.

Established 1838.

Bevin Bros. Mfg. Co.,

Easthampton, Ct.

Manufacturers of

SLEIGH BELLS

House, Tea, Hand, Gong Bell &c.

Bell Metal Kettles.

John T. Lewis & Bros

No. 231 South Front St.,

PHILADELPHIA.

JOHN T. LEWIS & BROS. WARRANTED PURE WHITE LEAD. PHILADA.

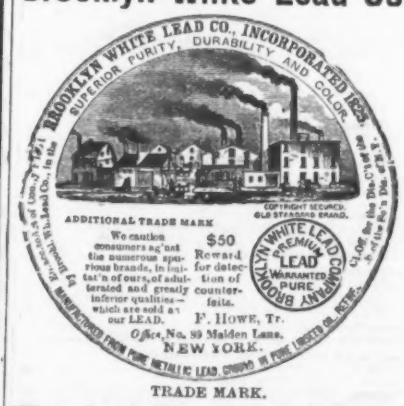
TRADE MARK.

MANUFACTURERS OF

Pure White Lead, Red Lead, Litharge, Orange Mineral, Linseed Oil,

AND PAINTERS' COLORS

Brooklyn White Lead Co.



TRADE MARK.

White Lead, Red Lead & Litharge.

89 Maiden Lane, NEW YORK.

FISHER HOWE, TREASURER.

JOHN JEWETT & SONS

Manufacturers of the well-known brand of

WHITE LEAD.

TRADE MARK.

ALSO MANUFACTURERS OF

LINSEED OIL.

182 Front Street, NEW YORK.

TRADE MARK.

The Atlantic White Lead and Linseed Oil Co.,

MANUFACTURERS OF

White Lead (Atlantic), Red Lead, Litharge & Linseed Oil.

ROBERT COLGATE & CO.,

287 Pearl Street, New York

S. H. JENNINGS. 239 Front St., New York, Importer of and Sole Agent in the United States for JENNINGS'S A. A. ENGLISH WHITE LEAD, RED LEAD and LITHARGE. *Genuine. Best Quality. Low Prices.* Please write for information and prices.

DUNBAR BROS.,

Manufacturers of

Clock Springs and Small Springs

of every description, from best Cast Steel,

BRISTOL, CONN.

Torrey's Door Springs.

P. R. DUNNE,

Manufacturer,

182 Fulton St.,

NEW YORK.

New York Wholesale Prices, September 10, 1879.

HARDWARE.

Anvils.
Eagle Anvils (American)....⅌ ℔ 9c dis 20 %
Wright's....⅌ ℔ 10¼c over 250 ℔s 10½c
Armitage's Mouse Hole....9½ @ 9¾c
Trenton....10c

Augers and Bits.
Conn. Valley Mfg. Co. } dis 50 & 10 %
Douglass Mfg. Co.
Humphreysville Mfg. Co
Ives
Beecher (French, Swift & Co)
Griswold
Nobles Mfg. Co.
Fasson's Patent
Cook's, Douglass Mfg. Co....dis 50&5 %
Cook's, Ives'....dis 45&10 %
Snell Mfg. Co.'s C. S. Augers....dis 50&10 %
" " B. Machine....dis 50&10 %
" " C. S. Bits....dis 40 %
" " Jennings' Bits....dis 35 %
Patent Solid Head....dis 30 %
Russell Jennings' Auger, Dowel, Machine-Dowel and Hand-Rail Bits....dis 10&10&10 %
Russell Jennings' Augers....dis 16⅔&10&10&10 %
Russell Jennings' Car and Machine Bits, Boring-Machine and Millwrights' Augers, dis 25&10&10&10 %
Imitation Jenning's Bits....dis 40@45 %
Ives' "Jennings" Bits....dis 33⅓&10 %
Lewis' Single Twist Bits....dis 40 %
Andrews Bits....dis 50 %
Griswold's Patent Bits....dis 30 %
Expansive Bits, Clark's, small, $18; l'ge, $26....dis 25 %
" " Ives'....$20 @ $30—dis 33⅓ %
" " Blake's....$20—dis 40 %
" " Parmelee's....$20 and $30..dis 33⅓ %
Hollow Augers Ives' } dis 40 %
" " French Swift & Co.
" " Douglas....dis 33⅓ %
" " Bonney's Adjust....⅌ doz $48—dis 40 %
" " Stearns' Adjust., ⅌ doz $48—dis 25&10 %
" " Ives' Expansive ...each $4.50—dis 40 %
" " Univ'sal Expansive, each $4.50—dis 20 %
Gimlet Bits....$7.50 ⅌ gross, dis 50 %
" Diamond....⅌ doz $1.00 dis 25&10 %
" "Bee"....dis 45&10 %
Double Cut Gimlet Bits Shepardson's....dis 40&10 %
" " Ct. Valley Mfg. Co....dis 30&10 %
" " Hartwell's....dis 60&10&10 %
" " Douglass'....dis 40 %
" " Ives'....dis 50&10 %
Morse's Bit Stock Drill, List of May 15, '78....dis 25 %
L'Hommedieu's Ship Augers....dis 15 %
Watrous Ship Augers....dis 15 %

Awl Hafts.
Sewing, Brass Ferrule....$3.50 ⅌ gross—dis 40&10 %
Peg "....3.50 " dis 40&10 %
Patent Sewing, Short....$1.00 ⅌ doz—dis 40&10 %
" " Long....$1.40 ⅌ doz—dis 10 %
" Peg, Plain Top....$10.00 ⅌ gross—dis 40&10 %
" " Leather Top....12.00 " dis 40&10 %

Awls, Brad Sets, &c.
Awls Sewing, Common....⅌ gross $1.35—dis 25 %
" Sewing, Best....⅌ gross 1.40—dis 10 %
" Shouldered Peg....⅌ gross 2.25—dis 15 %
" Patent Peg....⅌ gross .60—dis 15 %
" Shouldered Brad....⅌ gross $2.70—dis 25&10 %
" Handled Brad....$7.00 ⅌ gross—dis 25&10 %
" Handled Scratch....$7.00 ⅌ gross—dis 25&10 %
" Socket Scratch....$1.00@$1.25 ⅌ doz—net
Brad Sets, Aiken's....⅌ doz $12.00—dis 45&10 %
" No. 42, $10.50; No. 43, $12.50....dis 60&10 %
" Stanley's Excelsior, No. 1, $9.60...dis 25&10 %
" " No. 2, 4.80...dis 25&10 %
" " No. 3, 7.80...dis 25&10 %

Axes.	Light.	Med.	Heavy.	
M. H. Jones & Co.	$8.00	$8.50	$9.00	⅌ doz net.
Bloods	14.00	14.50	15.00	dis 35 %

Axles.
Common (Guy C. Hotchkiss, Field & Co.)....⅌ ℔ 3½c
Solid Collar, Case Hardened, Chilled Box....⅌ ℔ 8c
Axle Grease.—Frazer's....⅌ ℔ 6c

Balances.
All Spring Balances....dis 40 %

Bells.
Hand, Light Brass....dis. 75&10 %
" Extra Heavy....dis 50&5 %
" White Metal....dis 70 %
" Silver Chime....dis 25&10 %
" Globe (Cone's Patent)....dis 25&10 %
Gong, Abbe's....dis 30&10 %
" Yankee....dis 40&10 %
" Barton's....dis 40&10 %
Crank Taylor's....dis 25&10 %
" Brook's....dis 50 %
" Cone's....dis 10 %
" Connel's....dis 50&10 %
Lever, Sargent's, new list Dec., '78....dis 60&10&10 %
" Taylor's Bronze or Plated Lever....net
" Japanned Lever....dis 25&10 %
" R. & E. M. Co.'s....dis 50&10&10&2 %
Pull, Brook's....dis 50&10&2 %
" Western....dis 25&10 %
Call....dis 25 %
Cow, Common Wrought....dis 20&10 %
" Western....dis 20&10 %
" " Sargent's new list....dis 20&10 %
" Kentucky "Star"....dis 20&10 %
" " Sargent's new list....dis 20&10 %
" Dodge's Genuine Kentucky, new list—
Nos. 0 1 1½ 2 3 4 5 6 Hog } dis
$12.00 10.00 9.00 8.00 6.00 5.00 3.50 2.50 5.00 } 60 %
" Yaw's Genuine....dis 50 %
" Texas....dis 50&10 %
" Wilson's (Moore's)....dis 50 %

Bellows.
Blacksmiths', Common....dis 45 %
" Extra and Pittsburgh Pattern....dis 20 %
Moulders....dis 25 %
Hand Bellows....dis 25 %

Belting, Rubber.
N. Y. Belting and Packing Co....new list net

Bit Holders.
Extension, Barber's....⅌ doz $15.00—dis 40&5 %
" Ives'....⅌ doz $15.00—dis 40 %
Diagonal....⅌ doz $24.00—dis 40 %
Angular....⅌ doz $24.00—dis 40 %
Blind Adjusters.—Domestic....⅌ doz $5.00, dis 20 %
Blind Fasteners.—Mackrell's....dis 30 %
Van Sand's....No. 2000, per gross, $9.00 net
" old pattern....⅌ gross, $9.60 net
Washburn's Patent....⅌ gross $9.00 net
Merriman's....new list net
Mackrell's....⅌ doz. pairs, $0.65, dis. 10 %

Blind Staples.
Barbed, ⅝ in. and larger....⅌ ℔ 13c net
" ⅜ in....⅌ ℔ 20c net

Blocks.—Burr & Co....dis 25 %
Differential Pulley Blocks....dis 20 %
Penfield Block Works, Rope and Iron Strap'd..dis 45 %
" " " Wrot. Iron Com. bushed.dis 35 %
" " " " all steel roll'r.dis 20 %
" " " Sheaves " " dis 35 %
Stanley R. & L. Co., Rope and Iron Strap'd. dis 35&10 %

Bolts.
Cast Iron Barrel, Shutter, &c....dis 70&10 %
Cast Iron Chain (Sargent's list)....dis 70&10 %
Bush's Lever and Chain Bolts....dis 40, 10&10 %
Wrought Barrel....dis 60&10 %
" Square....dis 60&10 %
" Shutter, all Iron, Stanley's list....dis 65 %
" Brass Knob, " "....dis 50 %
" " Sargent's list....dis 60&10 %
" Sunk Flush, Sargent's....dis 66⅔&10 %
" " Stanley's....dis 35
" B.K.Flush, Com'n. Stanley's....dis 60&7½ %
" " Ex. Heavy. "....dis 40&10 %
" "Plated Knob & Slide Flush "....dis 50&10 %
Carriage and Tire, Common....dis 75&2½ % cash
" " Norway Iron....dis 70 %
" " Philadelphia....dis 70 %
" " Coleman....dis 60&10 @ 60&20 %
" " Shelton's....(old list) dis 70&5 %
R. B. & W. Carriage (old list)....dis 70&5 %
Tire, Am. Screw Co.'s, Phila....dis 70&5 @ 70&10 %
" "Bay State"....dis 80 %
" R. B. & W....dis 70&10&5 %
Star (Phila)....dis 60&10@60&20 %
Stove—American Screw Co.'s....dis 50 %
" R. B. & W....dis 50 %
Plow....dis 50&10 %
" R. B. & W....dis 50 %
Machine, List of July 15, '79....dis 60&5 %
Bolt Ends, " "....dis 60&5 %
Borax....10½@11½c ⅌ ℔ net

Boring Machines.	Upright.	Angular.	
First quality, no Augers	$5.00	$6.75	dis 45&10 %
" with Augers	8.50	10.25	dis 45&10 %
Snell's, no Augers	2.75	3.50	net.
Phillips' with Augers		12.00	dis 40 %

Braces.—Barber's Patent....dis 40&5 %
O. S. Backus....dis 50&10 %
Wilson Mfg. Co....dis 10 %
Spofford's Patent....dis 50&10 %
Noble's Patent....dis 40&5 %
Ives' Patent Braces....dis 55@55&10 %
Common Ball (American)....dis 50 %
Brackets.—Shelf (Sargent's)....dis 66⅔&10 %
Swing (T. & S. Mfg. Co.)....dis 33⅓ %
Bright Wire Goods list of July 8, 1879..dis 35&10 %
Bull Rings.—Union Nut Co....dis 50&20 %
Sargent's....dis 70&10 %
Hotchkiss'....low list dis 35 %
Humason Beckley & Co.'s (low list)....dis 60&10 %

Butts.
Wrought Brass....dis 55 %
Cast Brass, Tiebout's....dis 40&10 %
" Corbin's....dis 50&10 %
COMMON CAST, NOT [illegible].
Fast Joint, Narrow....dis 55&10 %
" Broad....dis 60&10 %
Loose Joint, Narrow and Broad....dis 70 %
DRILLED [illegible].
Fast Joint, Narrow....dis 50&10 %
" Broad....dis 55&10 %
Loose Joint....dis 60&10 %
" Japanned....dis 60&10 %
" with Acorns....dis 70&10 %
Parliament Butts....dis 60&10 %
Mayer's Hinges....dis 70&10 %
Loose Pin no Acorn....dis 70&10 %
" Acorns....dis 70&10 %
" Japanned....dis 70&10 %
" " Plated Tips....dis 70&10 %

WROUGHT IRON.
Fast Joint Narrow } dis 60 & 5 %
" Lt. Narrow
" Broad
Loose Joint, Broad
Table Butts, Back Flaps, &c.
Inside Blind, Regular
" Light
Loose Pin, Wrt.
Spring Hinges:
American Spiral Spring Butt Co., Jap'd....dis 25 %
" " " " Fancy....dis 10 %
Geer's Single and Double Acting....dis 25 %
Sabin Mfg. Co.'s Double Acting....dis 35 %
Union Spiral Spring, Japanned....dis 25 %
" " " Ornamental....dis 20 %
Union Spring Hinge Co.'s....dis 25 %
American Spring Hinge Co.'s....dis 25 %
Union Mfg. Co....dis 25 %
Bommer's....dis 25 %
Blind Butts, Parker....dis 75&10 %
" Palmer....dis 40&10&10&2 %
" Seymour....dis 70&10 %
" Shepard....dis 75&10 %
" Lull & Porter....dis 66⅔&10 %
" Nicholson....dis 45&10 %
" Huffer....dis 50@10 %
" Clark's, Nos. 1, 3, 5, 40 and 45...dis 75&10 %
" Buffalo "Noiseless"....dis 75&10 %
" Sargent's No. 12....dis 80&10 %
Bow Pins.
Hotchkiss'....low list dis 10 %
Humason, Beckley & Co.'s (low list)....dis 60&10 %
Sargent & Co.'s....$19.70 and $21.10, dis 70&10 %
Butchers' Cleavers.
Humason & Beckley Mfg. Co....dis 25 %
Bradley's....dis 25 %
Beatty's....dis 30&10 %
1 2 3 4 5 6 7 8
$16.50 19.00 21.50 24.00 27.00 30.00 33.50 36.50
Hart Mfg. Co....dis 50&10&2 %
0 1 2 3 4 5 6
$20.00 26.00 20.50 33.00 37.00 41.50 45.00

Can Openers.
Messenger's Comet....⅌ doz $3.00, dis 25 %
American....⅌ doz $2.00, dis 75 %
Duplex....⅌ doz 25c, dis 15@20 %
Lyman's....⅌ doz $3.75, dis 20 %
Poole....⅌ doz $3.75, dis 40 %
No. 4, French....⅌ doz $2.25, dis 60 %
No. 5, Iron Handle....⅌ gross $6.00 net
Eureka....⅌ doz $2.50, dis 10 %
Sardine Scissors....⅌ doz $7.00, dis 55 %
Star....⅌ doz $5.00, dis 25 %
Sprague....dis 50&10 %

Caps—Percussion, ⅌ 1000.
G. D. & S. B....30c
Double Waterproof, in 1-10's....$1.20
Colt's Pistol, "....65c
Musket, 1-10 "....60c
F. L....50c } dis 10&5 %
E. B. 1-10, Trimmed....65c
E. B. 1-10 Ground Edge....70c
Cartridges.—Metallic....dis 60&10&5 %
Cards.—Horse and Curry....dis 33⅓&10 %
Cotton....dis 25&10 %
Wool....dis 25&10 %
Car Pusher.—"Giant"....$6.25 each, dis 20 %
Carpet Stretchers.
Cast Steel, Polished....⅌ doz $5.00, dis 30 %
" Iron Steel Points....⅌ doz $2.00, dis 55 %
Casters.
Bed....dis 45&10 %
Plate and Shallow Socket....dis 45&10 %
Deep Socket....dis 30&10 %
Cattle Leaders.
Hotchkiss' Sons'....dis 10&10 %
Humason, Beckley & Co.'s (low list)....dis 60&10 %
Sargent's....dis 70&10 %
Chain.
Trace, 6½-1-2....⅌ pair 44 @ 45c
" 6½-10-3....⅌ pair 42 @ 43c
" 7-10-2....⅌ pair 49 @ 50c
German Halter Chain....dis 40&10 %
" Coil....dis 40&10 %
Oneida Halter Chain....dis 40 %
Galvanized Pump Chain....⅌ ℔ 10½c dis 20 %
Jack Chain, Iron....dis 60&10&10 %
" Brass....dis 55&10 %
Chalk.
White....⅌ gross 55c net
Red....⅌ gross 75c net
Blue....⅌ gross 90c net
White Crayons....⅌ gross 14c net
Chisels.
Socket Framing, Crossman....dis 70 & 5 %
" " Buck Bros....new list, dis 25 %
" " Merrill....dis 70 %
" " Witherby Tool Co....dis 70 %
" " Douglass'....dis 70 %
" Firmers, Crossman....dis 70&5 %
" " Buck Bros....new list, dis 25 %
" " Merrill....dis 70 %
" " Witherby Tool Co....dis 70 %
" " Douglass'....dis 70&5 %
" Corner....dis 65@70 %
Tanged Firmers extra....dis 40 %
" " Butcher's....$5.00 @ $5.25 to £
" " Spear & Jackson's....5.00 to £
" " Buck Bros (Shank)....5.00 to £
Clamps.
Iron, Providence Tool Co.'s, Wrt. Iron....dis 25 %
" Adjustable, Gray's....dis 20 %
" " Lambert's....dis 20 %
" " Snow's....dis 40&5 %
" " Hammer's....dis 15 %
" " Stearns'....dis 15@10 %
" Cabinet, Sargent's....dis 60&10&10 %
" Carriage Makers', Sargent's....dis 60&10&10 %
" Cord and Tape (T. & S. Mfg. Co.)....dis 30 %
Clips, Axle.
Norway or Best....dis 60&10 %
Superior....dis 65&10 %
Cockeyes....1¼ in., 28c; 1½ inch, 33c; 1¾ in., 37c, net
Cocks, Brass.
Racking....dis 45 %
Globe....dis 45 %
Plain Bibbs....dis 45 %
Ale and Beer....dis 50 %
Coffee Mills.
Board and Box....dis 25 %
Increase Wilson's....net
Selsor's Pat....$9.50, $10.50, dis 25 %
American (Enterprise Mfg. Co.)....dis 20 %
French Steel....dis 20 %
The Swift (Lane Bros.)....dis 25 %
Combined Dinner Pail and Lantern.
Per doz $15.00....dis 30 %
Compasses, Dividers, &c.
Compasses....dis 50&10 %
Callipers....dis 55&10 %
Dividers....dis 60 %
Bemis & Call Co.'s Dividers....dis 60&20 %
" " Compasses & Callipers....dis 55 %
" " Wing & Inside or Outside.dis 50&5 %
" " Double....dis 60 %
" " Call's Pat. Inside....dis 35&10 %
Cook's....dis 15 %
Excelsior....dis 50 %
Miller's Patent....dis 25 %
Coopers' Tools.
Bradley's....dis 15 @ 20 %
Corkscrews.—Humason & B....dis 40 %
Corn Knives and Cutters.—Bradley's..dis 10 %
Wadsworth's....dis 33⅓ %
Crow Bars.
Cast Steel....⅌ ℔ 6¼c
Iron, Steel Points....⅌ ℔ 4½c
Curling Irons, &c.
⅝, ¾, ⅞ in., $1.80, 2.00, 2.40....dis 10 %
Curling Tongs....⅌ doz $3.65, dis 10 %
Pinching Irons....⅌ doz 7.50, dis 20 %
Curry Combs.
Fitch's (List of No. 240, $1)....dis 50 %
Hotchkiss' Novelty....dis 20&10 %
Lawrence....dis 50 %
Lawrence, with detachable Mane Comb....dis 37½ %
Rubber....⅌ doz $9.00, dis 20&10 %
Curtain Pins.—Silvered Glass....dis 15 %
White Enamel....dis 15 %
Cutlery.
Meriden Cutlery Co. (Table)....net
Am. Miller Bro.'s Cutlery Co....dis 25 %
Humason & Beckley, Pocket....dis 33⅓ %
Naugatuck Cutlery Co....list net
Aaron Burkinshaw's Pocket....dis 35 %
Dog Collars.
Embossed Gilt....dis 20 %
Leather....dis 30 %
Brass....dis 25 %
Door Springs.
Torrey's Rod....⅌ doz $1.75 net
Gray's "....⅌ doz $1.65, net
Bee Rod....⅌ doz $1.60, net
Gem (Coil)—
No. 1, Large, Japanned....⅌ doz $3.50 } dis 20 %
No. 2, Medium, "....⅌ doz 2.50
No. 3, Small, "....⅌ doz 2.00

Challenge (Coil)—	Nos. 9	7	6	
Japanned....⅌ doz	$2.00	2.50	3.50	dis 30 %
Coppered....⅌ doz	4.00	4.50	5.00	
Galvanized....⅌ doz	3.50	4.00	4.50	
Nickeled....⅌ doz	5.50	6.00	7.00	
Premium (Coil)—	Nos. 1	2	3	
Japanned....⅌ doz	$7.50	6.25	5.00	dis 30 %
Nickeled....⅌ doz	11.00	9.50	8.00	

Star (Coil)—For Cop'd, Nickel-Plated, &c. see list.
No. 4 ("Shoo Fly") Screen door size ⅌ doz $1.75 } dis 25&10 %
No. 5, Screen Door Size....⅌ doz $2.00
No. 6, Medium....⅌ doz 2.50
No. 7, Large....⅌ doz 3.50
Sabin's Lever...No. 1, $1; 2, $1.50; 3, $2; 4, $2.50; dis 35 %
Sabin's Boss, No. 1, $5.40; 2, $4.20; 3, $3.60..dis 50&10 %
Sabin's Crown....⅌ doz $2.75, dis 50&10 %
Philadelphia....5 in., $5.00; 8 in., $7.00, dis 35 %
Barker's Concealed....dis 20 %
Cowell's....No. 1, $18.00; No. 2, $15.00 ⅌ doz, dis 50 %
Rubber, complete....⅌ doz $1.90, net
Drawing Knives.
Crossman's No. 1....dis 70&5 %
Merrill....dis 70 %
Nobles Mfg. Co....dis 15 %
Bradley's....dis 35 %
Adjustable Handle....dis 20 %
Witherby Tool Co....dis 70 %
Douglass....dis 70 %
Drills and Drill Stocks.
Blacksmiths'....each $1.80 net
Blacksmiths' Self Feeding....each $7.50, dis 20 %
Breast, P. S & W....dis 35 %
" Hotchkiss....dis 25 %
Breast, Wilson's....dis 20 %
" Miller's Falls....each $2.50, dis 25 %
" Bartholomew's....each, $2.50 dis 25&10 %
Ratchet, Merrill's....dis 25 %
" Ingersoll's....dis 25 %
" Whitney's....dis 30 %
" Weston's....dis 20 %
" Moore's Triple Action....dis 20 @ 25 %
Whitney's Hand Drill....dis 50 %
Wilson's Drill Stocks....dis 10 %
Automatic Boring Tools....each $2.75, dis 30 %
Drill Chucks.—Morse's Beach Patent....dis 30 %
" " Adjust..each $10.00, dis 30 %
Danbury....$8.00, dis 30 %

Egg Beaters.
Dover....⅌ gross, $42.00; ⅌ doz $4.00 net
National....⅌ doz $4.50, dis 33⅓ %
Elevator Buckets.
Mill E. Buckets, light, 3½ to 10 in., (Duc's Improved) ⅌ 100 $15.00 @ $54.00, net
Mill E. Buckets, heavy, 5 to 10 inches (Duc's Improved) ⅌ doz $5.60 @ $10.20, net
Storehouse, (Duc's Patent) 12 to 17, $12.00 @ $20.00...net
Emery and Emery Paper.
Genuine Chester—Regular Nos....⅌ ℔ 6c
" " Flour and FF....⅌ ℔ 5c
" " in 10-lb. cans....2c extra
Washington Mills—Regular Nos....⅌ ℔ 8c
" Flour....⅌ ℔ 5c
Wellington Mills, Grain....⅌ ℔ 10c net
" " Flour....⅌ ℔ 8c net
Hampden Emery Grain....5c net
" " Flour....3c net
B. & A. Emery Paper....dis 20@25 %
Enameled and Tinned Ware.
Kettles....dis 45 %
Sauce Pans....dis 35 %
Tinned Sauce Pans....dis 35 %
Escutcheon Pins.
Iron....dis 33⅓ %
Brass....dis 45 %
Escutcheons.
Door Lock....Same discounts as Door Locks
Brass Thread....dis 60&10 %
Wood....dis 25 %

Faucets.
Fenn's....dis 50 %
Fenn's Cork Stops....dis 40 %
Star....dis 55&10 %
Frary's Patent Petroleum....dis 25&10 %
Wood and Metallic....dis 40 %
West's Patent Key....dis 45 %
Metallic Key, Leather Lined....dis 45 %
Cork Lined....dis 70&10 %
Enterprise (Self Measuring)....⅌ doz, $36.00, dis 20 %
Felloe Plates....⅌ ℔ 15c, dis 55 %
Files.
American File Co....$5.00 to £, dis 35 %
Auburn....$5.00 to £, dis 35 %
Arcade....$5.00 to £, dis 35 %
G. & H. Barnett....dis 25 %
Nicholson....(Nicholson List) dis 35 %
Heller & Bros....$5.00 to £ dis 25 %
Madden & Cockayne File Co....$5.00 to £, dis 25 %
J. & Riley Carr....4.50 to £
Stubs'....$7.00 @ 7.50 to £
Butcher's....4.50 to £
Walter Spencer & Co.'s "Diamond"....4.50 to £
Fisher's....4.75 to £
Moss & Gamble....4.50 to £
H. Disston & Sons (new list)....dis 35 %
Western (new list)....dis 35 %
Limet & Co. (French)....$4.25 to £
Fluting Machines.
Knox, 4-inch Rolls....$2.50 each net
" 6 "....3.00 each net
" 8 "....5.00 each net
Peerless, 4-inch Rolls....4.00 each net
" 5 "....4.75 each net
Eagle, 3½-inch Roll....$1.62½ each net
" 5½ "....$2.12½ each net
Eureka, No. 1, 7-inch Roll....6.50 each, dis 33⅓ %
" No. 2 5-inch Roll....5.50 each, dis 33⅓ %
Crown....4½-in., $2.62½; 6-in., $3.00; 8-in., $5.00 each net
Star....4½ in., $3.50; 6 in., $4.00 each net
Crown Jewel....6 in., $2.50 each net
Domestic Fluter....1.50 each net
Geneva Hand Fluter, No. 1....⅌ doz $15, dis 20 %
Crown Hand Fluter, Nos. 1, $12; 2, $10; 3, $8 ⅌ doz. net
Shepard Hand Fluter....No. 75 ⅌ doz $15, dis 10 %
" " "....No. 104, ⅌ doz $12.00 net
Clark's Hand Fluter....⅌ doz $15.00, dis 20 %
Combined Fluter and Sad Iron....⅌ doz 15.00, dis 30 %
Buffalo....⅌ doz 10.00, dis 10 %
Fluting Scissors....dis 45&10 %
Forks.
Hay, Manure and Spading....new list, dis 15 %
Plated" A 1, Rogers & Bro....dis 40&5 %
" Reed & Barton....dis 40&5 %
Fruit and Jelly Presses.
Enterprise Mfg. Co....dis 20 %
Fry Pans.
Burnished, list as follows....dis 65&10 %
No. 0 1 2 3 4 5 6 7 8
⅌ doz....$3.00 $3.75 4.25 4.75 5.25 6.00 7.00 8.00 9.00
Acme Patent, same list as above....dis 45&5 %

Gauges.
Marking, Stanley's....dis 50&10 %
" Chapin's....dis 50&10 %
Wire....dis 10 %
" Smith's Patent....⅌ doz $18.00, dis 40 %
Gimlets.
Nail and Spike....dis 55 %
"Bee" Gimlets....⅌ gross $12.00 dis 60&10 %
"Eureka" Gimlets....dis 50 %
"Diamond" Gimlets....dis 40 %
Double Cut Shepardson's....dis 40&10 %
" " Hartwell's....dis 50 %
" " Ives'....dis 55 %
" " Douglass'....dis 40 %
Glue Pots.
Tinned and Enameled....dis 50 %
Family, Howe's "Eureka"....dis 40 %
" L. F. & C.'s "Handy"....dis 40 %
Grindstone Fixtures.
Sargent's Patent....dis 70&10 %
Reading Hardware Co....dis 40&10&2 %
" " "Keystone"....dis 45&5&10&2 %

Hammers.
Maydole's, New List of Dec. 10th, 1878....dis 15 %
Cheney's, List January, '79....dis 25 %
H. Hammonds....dis 20 %
Verree....dis 5 %
Magnetic Tack, Nos. 1, 2, 3, $1.25, 1.50 and 1.75.dis 25&10 %
Warner & Noble's....dis 10 %
Kip's (new list, Dec. '78)....dis 30 %
Hand Cuffs and Leg Irons.
Providence Tool Co.'s Hand Cuffs, $15.00 ⅌ doz } dis 10 %
" " Leg Irons, $25 ⅌ doz
Tower's....dis 25 %
Handles.—Door or Thumb Latches—
Nos....0 1 2 3 4
Per doz....$0.80 1.00 1.18 1.35 1.50....dis 70&10 %
Roggin's Latches....per doz 28 @ 35c net
Bronzed Iron Drop Latches....⅌ doz 60 @ 80c net
Jap'd Store Door Handles—Nuts, $1.25; Plate $0.80 no Plate, 65c....net
Barn Door....per doz $5.00, dis 70&10&10 %
Wrought Chest....dis 70 %
Surface Chest, Sargent's list....dis 75&10 %
Flush Chest....dis 70&10 %
Lifting....dis 70 %
Saw and Plane....dis 40&10 %
Hammer and Hatchet....dis 20 %
Brad Awl....⅌ gross $2.00, dis 25&10 %
Hickory Firmer Chisel, assorted, ⅌ gross $4.50 } dis 25&10 %
" " " large, " 5.00
Apple " " assorted, " 5.00
" " " large, " 6.00
Socket " " assorted, " 3.00
" Framing " assorted, " 5.00
File, assorted, ⅌ gross....2.75
Auger, assorted, ⅌ gross....6.00
" large, "....7.00
Patent Auger, Ives'....dis 25&10 %
" " Douglass'....⅌ set $1.25, dis 10 %
" " Swan's....⅌ set $1, dis 20&10 %
Hangers.
Barn Door....dis 70&10 %
Novelty....dis 40 %
Challenge....dis 50 %
Climax (Anti-Friction)....dis 50&10 %
Sterling Improved (Anti-Friction)....dis 75&10 %
Cheritree....dis 20&10 %
Harness Snaps.
Henshaw's....List of 1½ changed to 14.00, dis 55 %
Judd's.... " " 14.00, dis 60 %
Fitch's (Bristol) " " 14.00, dis 55 %
Hotchkiss'....dis 10 %
Andrews'....dis 50 %
Sargent's....dis 66⅔&10 %
New York Wire....dis 20&20 %
"German....dis 70 %
Covert....dis 40&10 %
Hatchets.
Isaiah Blood....dis 35 %
Shingling, Nos. 1 2 3....⅌ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3....⅌ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3....⅌ doz 7.50 8.00 8.50
Hunt's....dis 20 & 10 %
Shingling, Nos. 1 2 3....⅌ doz $7.25 $8.00 $8.75
Claw, Nos. 1 2 3....⅌ doz 7.75 8.50 9.25
Lathing, Nos. 1 2 3....⅌ doz 7.50 8.25 9.00
Hurd's....dis 45 %
Shingling, Nos. 1 2 3....⅌ doz $8.00 $8.50 $9.00
Claw, Nos. 1 2 3....⅌ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3....⅌ doz 8.00 8.50 9.00
Simmon's....dis 35 %
Shingling, Nos. 0 1 2 3....⅌ doz $7.50 $8.00 $8.50 $9.00
Claw, Nos. 1 2 3....⅌ doz 9.00 9.50 10.00
Lathing, Nos. 1 2 3....⅌ doz 8.00 8.50 9.00
Broad, Nos. 1 2 3 4....⅌ doz 9.00 10.00 12.00 14.00
" Nos. 5 6 7 8....⅌ doz 16.00 18.00 20.00 22.00
Collins....dis 10 %
Shingling, Nos. 1 2 3....⅌ doz $6.00 $6.50 $7.00
Claw Nos. 1 2 3....⅌ doz 6.50 7.00 7.50
Lathing, Nos. 1 2 3....⅌ doz 6.00 6.50 7.00
Hay Knives.
"Lightning"....⅌ doz $20.00 net
Wadsworth's....dis 33⅓ %
Hinges.
Gate, Western....⅌ doz $6.25, dis 70&10 %
" N. E....⅌ doz $10.13, dis 70&10 %
" N. E. Reversible....⅌ doz $10.13, dis 70&10 %
Gate, Clark's No. 1....⅌ doz $6.00, dis 50&10 %
" N. Y. State....⅌ doz $6.10, dis 70&10 %
" Automatic....⅌ doz $12.50, dis 40 %
" Common Sense....dis 20&10 %
" Seymour's....dis 40&10 %
" Shepard's....No. 10 ⅌ doz $7.00, dis 50&10 %
Rolled Blind Hinges....dis 60&10&10 %
Rolled Plate....dis 60&10 %
Rolled Raised....dis 60&10 %
Wrought Strap and T, list Dec. 20, '77....dis 50&10 %
Plate Hinges } 8, 10 & 12 in. 5¼c ⅌ ℔ } ....dis 10 %
"Providence"... } over 12 in. 4¾c ⅌ ℔
Screw Hook and Strap....{ 8, 10, 12 in., 5¼c; 14 to 36 in., 4¾c } dis 10 %
Heavy Welded Hook....{ 8 to 12 in., 11 c; 14 in. & up, 9½c } ..dis 30 %
Screw Hook and Eye....{ ⅝ & 1 in., 10c; ¾ in. 12c; ⅝ in. 14c; ½ in. 16c } dis 35 %
Hoes.—Solid Shank, C. S....⅌ doz $5.25, dis 15 %
Socket....⅌ doz 5.75, dis 15 %
Riveted Shank....⅌ doz 3.35 dis 15 %
Grub....dis 30 %
Planters'....dis 30 @ 35 %
Scovill Pattern....dis 25 @ 30 %
Scovill Pattern, Handled....dis 25 %
Hick's Pat. Solid C. S. Planters'....dis 20&10 @ 30 %
" " Scovill Pattern dis 20&5 @ 35 %
Winsted & Lane, Planters....dis 25@30 %
" " Scovill Pattern....dis 20@25 %
Hooks.
Bird Cage, Sargent's list....dis 70&10@70&10&10 %
Cotton....dis 50 %
Cotton, Patented (N. Y. Mallet & Handle Wks), dis 30 %
Cotton (Humason & Beckley Mfg. Co.)....dis 40 %
Belt, (new list) ⅌ c....dis 30&10 %
Bench—Hotchkiss' $5.00 ⅌ doz....dis 10 %
" Weston's, No. 1, $10.00; No. 2, $9.00 ⅌ doz dis 25 %
" McGill's, $3.00 ⅌ doz....dis 10 %
" Skinner's, $6.25 per doz....dis 20 %
Clothes Line Sargent's list....dis 70&10 %
" " Reading list....dis 50&10&2 %
Ceiling.. } Sargent's list....dis 66⅔&10 %
Harness. } Reading list....dis 50&10&2 %
Coat and Hat, Sargent's list....dis 66⅔&10 %
" " Reading....dis 50&10&2½ %
" " T. & S. Mfg. Co's list....dis 25 %
Tassel (T. & S. Mfg. Co.)....dis 40 %
Wrought Staples and Hooks and Staples....dis 75&10 %
" Staples, Stanley's list....dis 40 %
Wire Screw Hooks and Eyes, new list....dis 35&10 %
Grass and Bush....dis 40@45 %
Whiffletree—Patent....dis 45 %
Hooks and Eyes—Malleable Iron....dis 70&10 %
" Brass....dis 65&10 %
Horse Hay Forks.
Am. Double Acting, $7 each....dis 30 @ 40 %

Horse Nails

	Nos. 5	6	7	8	9	10	
Ausable....⅌ ℔	30c	27c	25c	24c	23c	22c	dis
" Finished, Polished or Blued... "	31c	28c	26c	25c	24c	23c	30 %

A C.... 60 50 40 26 24 22 21 20 19 18 18 18c } dis
Nos.... 1 2 3 4 5 6 7 8 9 10 11 12 } 15 %

	Nos. 5	6	7	8	9	10	
Bridgewater Iron Co. Pointed and Polished	26c	23c	21c	20c	19c	18c	
Cortland P't'd & Blued..	26c	23c	21c	20c	19c	18c	
Globe (New list)..	26	23	21	20	19	18c	d's 10 %
H. P. Pointed and Finished	26	23	21	20	19	18	dis 20 %
North Western Fini'h'd	26	23	21	20	19	18c	net
" " Plain	25	22	20	19	18	17c	net
National, Pointed and Polished, Pat. Fin.		25	23	22	21	20c	net
Putnam Hammer, P't'd	26	23	21	20	19	18c	net
Vulcan P't'd & Blued.	26	23	21	20	19	18c	10 %

Horse Shoes.—Burden....⅌ keg $3.62½
R. I. Horse Shoe Co., Perkins' Improved Light, Medium and Heavy....⅌ keg 3.62½
Mule Shoes....⅌ keg 4.62½
Perkins' Snow....⅌ keg 4.12½

Ice Awls, Chisels, &c.
American Ice Chisel....⅌ doz. $6.00 dis 45 %
National....⅌ doz $6.25 dis 20 %
Novelty Ice Breakers....⅌ doz $6.25 dis 20 %
White's Sliding Head Picks....⅌ doz $2.50 dis 40 %
Dunlap's Ring Picks....⅌ doz $3.00, dis 40&10 %
Wood Head Picks, Sargent's ⅌ doz $1.85, dis 60&10&10 %
Iron "....⅌ doz 1.85, dis 60&10&10 %
Ice Mallets Pick in Head....⅌ doz 1.75 net
" Pick in Handle....⅌ doz 3.00 net
Ice Axes, Small Castor Malleable....⅌ doz 1.20 net
Kitchen Ice Tongs....⅌ doz 2.25 net
Combination Ice Tools....⅌ doz $2.40 dis 30&10 %

Kettles.
Brass, 7 to 13 inches inclusive....⅌ ℔ 35c net
Brass, larger than 13 inches....⅌ ℔ 40c net
Enameled....dis 60&10 %
Knives.
Ames' Butcher Knives....dis 20 %
" Shoe....dis 15 %
" Bread....⅌ doz $1.50, dis 15 %
Moran's Shoe and Bread Knives....dis 20 %
Hay and Straw— Wadsworth's....dis 33⅓ %
Table and Pocket....See Cutlery
Knobs.
Carriage (Jap'd 80c. ⅌ gross)....dis 60&10 %
Base—Common....dis 30&10 %
" Elastic End, No. 8....dis 70 %
Hemacite Door Knobs....New list, dis 35&5 %
Door, Mineral } Same discounts as Door Locks.
" Por. Jap'd
" Plated
" Por.
Furniture, Plain....75c gross inch, dis 10 %
" Wood Screws....dis 20 %
Picture (T. & S. Mfg. Co.)....dis 50 %
" Sargent's....dis 60&10&10 %
Hemacite Picture....dis 35 %
Shutter, Porcelain....dis 60&10&10 %

Ladles.
Melting—Sargent's....dis 60&10 %
" Reading....dis 35&10&2 %
" Monroe's Patent....⅌ doz $4.00, dis 20 %
Lanterns.
Tubular....No. 0, $8.65; No. 1, $10.15 } net With Guards, 35c extra.
Hurricane....dis 25 %
Peerless....No 5, ⅌ doz $11.75, dis 10&10 %
Brady's Patent....dis 10&10 %
Ætna....dis 10&10 %
Yankee....dis 10&10 %
De Beque....dis 10&10 %
Police, Small, $7.50; Med., $9.00; Large, $12.00, dis 20&10 %
Convex Reflector....$3.00 ⅌ doz, dis 10 %
Lemon Squeezers.
Porcelain Lined....⅌ doz $4.00@4.50 net
Eureka, Tinned....⅌ doz $8.00, dis 10 %
Dunlap's Improved....⅌ doz $4.00 net
Sammis'....No. 1, $7.00; No. 2, $12.00 ⅌ doz., dis 55 %
Townsend's Patent....$6.00 ⅌ doz., dis 33⅓ %
Lines.—Linen Fish....dis 25&10 %
Cotton Chalk....dis 55 %
Sil. Lake Chalk....Nos. 0, 1, 2, 3, $6.00, $6.50, $7.00, $7.50....dis 15&10 %
Mason's Linen....dis 25&10 %
Wire Clothes, Galvanized....each 30 @ 40c net
Locks and Latches.
Cabinet—Eagle } Reduction in list of some numbers March 1, 1879.
" Gaylord
" Bridgeport....dis 25&2 %
" Barnes & Deitz....dis 30 %
Trunk....dis 25 %
Langstroth & Crane's List Jan. 1, '77.
Round Key, No. 1 to 5....dis 50&10 %
" No. 5½ to 13....dis 40& 10 %
Flat Key....dis 33⅓&10 %
Barnes & Deitz, Flat Key....dis 30 %
Yale Lock Co., Flat Key....dis 40 %
"Shepardson" or "U. S."....dis 35 %
"Felter" or "American"....dis 33⅓ %
Plate....dis 33⅓&5&2 %
F. Many's "Extension Cylinder"....$10.50 ⅌ doz, net
DOOR LOCKS, &C.
Branford....dis 60&10&2 %
Norwalk....dis 50&10&2 %
Norwich....dis 50&10&2 %
Russell & Erwin....(List August, 1879)....dis 70&2 %
Mallory, Wheeler & Co. (List August, 1879)....dis 50&2 %
Reading Hardware Co....dis 35&10&2 %
Trenton....dis 40&5&2 %
Continental....dis 33⅓ %
Padlocks—Russell & Erwin....dis 33⅓&5 %
" Mallory, Wheeler & Co.... } and 2 % for cash
" Wm. Wilcox & Co....
" Yale Lock Mfg. Co.'s "Standard"....dis 40 %
" Romer's....dis 40 %
" Conestoga....dis 60 %
" J. H. McWilliams....dis 10 %
" Barnes & Dietz....dis 35 %
" Penn Lock Works....dis 20 %

Mallets.—Hickory and Lignumvitæ....dis 20 %
Meat Cutters.
Dixon's (P. S. & W.) Nos. 1 2 3 4
⅌ doz..$14.00 17.00 19.00 30.00—dis 25 %
Miles' Challenge....Nos. 1 2 3
⅌ doz..$22.00 30.00 40.00—dis 30 %
Perry's Nos. 1 2 3 4 4 g'rd 5 g'rd
Each....$3.00 4.00 5.00 11.00 13.00 30.00 dis 30&10
Woodruff's (P. S. & W.)....Nos. 100 150
⅌ doz .$15.00 18.00—dis 30&10 %
Hales'....Nos. 11 12 13
⅌ doz..$36.65 44.40 56.60..dis 50&10&2 %
Draw Cut....Nos. 5 2 6 8 10
Each..$50.00 75.00 80.00 225.00 400.00—dis 30 %
American....dis 25 %
Nos.... 1 2 3 4 B 5
Each....$5.00 7.00 10.00 25.00 50.00 60.00
Silver & Deming....dis 25 %
Mincing Knives.
Am., 1 blade, $12; 2 blades, $21; 3 blades, $30 per gross....
Lathrop's....dis 25&10 %
Smith's....per doz $1.75, dis 10 %
Molasses Gates.
Stebbins Pattern....dis 60&10 %
" Genuine....dis 60&10 %
" Tinned Ends....dis 40&10 %
Chase's Hard Metal....dis 30 %
Bush's....dis 20 %
Lincoln's Genuine....dis 60&10 %
Weed's....dis 15 %

Nails....See Trade Report
Nuts and Washers.
Square Nuts....7c off list
Hexagon Nuts....8c off list
Washers....7c off list
Nut Crackers
Table (Humason & Beckley Mfg. Co.)....dis %
Blake's Pattern....⅌ doz $2.00, dis 10 %

Oakum.
Best....⅌ ℔ 10 c
U. S. Navy....⅌ ℔ 8¾c
Navy....⅌ ℔ 7½c
Oilers.—Zinc and Tin....dis 55&10 %
Brass and Copper....dis 55 %
Olmsted's....dis 45&10 %
Broughton's....dis 50 %
Malleable (Hammer's)....⅌ doz $5.00, dis 10 %
Prior's Patent or "Paragon," Zinc....dis 55&10 %
" " Brass....dis 55 %
Ox Balls....dis 60&10 %

Pencils.
Faber's Carpenters'....High list, dis 4 & 10 %
" Round Gilt....⅌ gross $5.25 net
Dixon's Lead....⅌ gross 4.50 net
" Lumber....⅌ gross 6.75 net
Packing, Steam.
N. Y. Belting and Packing Co....new list net
Picture Nails.
Brass Head, Sargent's List....dis 60&10 %
" T. & S. Mfg. Co....dis 50 %
Porcelain Head, Sargent's List....dis 60&10 %
" " Judd's List....dis 40 %
Porcelain Head, T. & S. Mfg. Co....dis 40 %
Pinking Irons....⅌ doz 75c, net
Plaiting Machines.
Magic....⅌ doz $10.00, net
Astor Plaiting Machine....each $15.00, dis 20 %
Crown Plaiting Machines....dis 25 %
6in., $6.00. 10in., $10.00 each
Planes and Plane Irons.
Bench, First Quality....dis 35 % } Extra dis. 10 % for
" Second "....dis 45 % } cash in 10 days.
Moulding....dis 35&10 %
Bailey's (Stanley R. & L. Co.) new list Jan. '79.dis [illegible]&10 %
The Stanley (S. R. & L. Co.) " "....dis 25&10 %
Bailey's "Victor"....dis 25&10 %
Defiance Adjustable, new list....dis 25&10 %
Plane Irons, Butcher's....$5.50 to £
" Buck Bros....$5.00 to £
" Auburn Tool Co.'s....dis 25 %
" Defiance....dis 25&10 %
" Middletown Tool Co....dis 2 & 10 %
" Ohio Tool Co....dis 20&10 %
" Spear & Jackson's....$5.00 to £
" Sandusky Tool Co....dis 25&10 %
Pliers and Nippers.
Button's Patent....dis 33⅓ %
Hull's Patent Nippers, No. 1, $15; No. 2, $21 ⅌ doz, dis 25 %
Humason & Beckley Mfg. Co....dis 33⅓ %
Gas Pliers....dis 55 %
Eureka Pliers and Nippers....dis 25 %
Russell's Parallel....dis 25 %
P. S. & W. Cast Steel....dis 40 %
" " End Cutting Nippers....dis 25 %
" Tinners' Cutting Nippers....dis 20 %
Plumbs and Levels.
Disston's....dis 70 %
Stanley R. & L. Co.'s Pat. Adjustable....dis 65&10 %
" " Non-Adjustable....dis 65&
Chapin's Patent Adjustable....dis 65&10 %
" Non-Adjustable....dis 65&10 %
Standard Rule Co.'s New Adjustable....dis 60&10 %
" Non-Adjustable....dis 60&10 %
Johnson's Patent Adjustable....dis 60&10 %
Pocket Levels....dis 65&10 %
Post Hole and Tree Augers.
Samson Post Hole Digger....per doz $36.00, dis 20 %
Fletcher Post Hole Augers....⅌ doz 36.00, dis 20 %
Vaughan's Post Hole—
6 in. $23.60; 7, 8 and 9 in. $25 per doz....dis 20 %
Leed's....$5.00 each, dis 45 %
Eureka....⅌ doz $40.00, dis 40 %
Potato Parers, &c.
Bay State....⅌ doz $13.00 dis 10 %
Saratoga" Peeler and Slicer....⅌ doz 7.75 dis 10 %
Pruning Hooks and Shears.
Disston's Combined Pruning Hook and Saw per doz $18.00, dis 20 %
" Pruning Hook.... " 11.50, dis 20 %
Pruning Shears....⅌ doz $4.50@$5.00 net
Pulleys.
Judd's Axle....⅌ doz $0.50, dis 40 %
Hot House and Tackle....dis 70&10 %
Jap'd Screw....dis 70&10 %
Brass Screw....dis 60&10&10 %
Jap'd Side....dis 70&10 %
" Clothes Line....dis 70&10 %
Hay Fork Solid Eye, $4.00; Swivel, $5.00, dis 10&10&10 %
" " "Anti-Friction,"....$7.50 dis 2 & 10 %
" " "F" Common and Pat. Bushed....dis 25 %
" " Tarbox Pat. Iron....dis 35 %
Shade Rack....dis 20 %
Punches.
Bel's or Drive....⅌ doz $2.00; 2.25; 2.50, dis 50 %
Bemis & Call Co.'s Cast Steel Drive....dis 40&30 %
" " Springfield Socket....dis 50&10 %
Spring....⅌ doz $7.00, dis 50 %
" Leach's Patent....dis 15 %
Bemis & Call Co.'s Spring and Check....dis 50 %
Solid, Tinners'....⅌ doz $1.44, dis 50 %

Rail.
Sliding Door Wrought Brass....⅌ ℔ 28c dis 25 %
" Iron, Painted....⅌ foot 9c, dis 60 %
Barn Door, ½, ⅝ and ¾ inch....dis 75&10 %
" for N. E. Hangers....dis 75&10 %
Rakes.
Cast Steel....dis 15 %
8 10 12 14 16 teeth.
$5.00 5.75 6.50 7.25 8.00
Malleable....dis 15 %
10 12 14 teeth.
$3.60 4.00 4.40
Razor Straps.
Genuine Emerson....dis 40 %
Badger's Emerson....dis 40 %
Badger's (not Emerson)....dis 25 %
Evans'....dis 40 %
Imitation Emerson....⅌ doz $2.75, dis 40&10 %
Hunt's....dis 40&5 %
Chapman....dis 15 @ 20 %
Saunder's....dis 10 %
Torrey's....dis 25
Rivets.
Iron and Tinned....dis 50 %
In bulk, new list of Jan. 10, 1878....dis 35 %
Copper Rivets and Burs....dis 50 %
Nos.. 7 8 9 10 11 12 13 14 15
⅌ ℔..49c 50c 52c 54c 56c 48c 60c 64c 70c
Tinned Iron Belt Rivets and Burs....dis 35 %
Rivet Sets....dis 50 %
Rods.
Stair....New list, March 1, '79, dis 33⅓ %
" American Patent....dis 40 %
Rollers.
Barn Door, Sargent's list....dis 70&10 %
Novelty....dis 10 %
Acme (Anti-Friction)....dis 40 %
Rope. Manufacturers' Net List July 2, 1879.
Manila....½ inch and larger ⅌ ℔ 13 c
"....⅜ inch ⅌ ℔ 13¼c
"....¼ and 5-16 inch ⅌ ℔ 14 c
" Tar'd Rope....⅌ ℔ 12½c
" " Lath Yarn....⅌ ℔ 14 c
" Hay Rope....⅌ ℔ 13 c
Sisal....½ inch and larger ⅌ ℔ 11 c
"....⅜ inch ⅌ ℔ 11½c
"....¼ and 5-16 inch ⅌ ℔ 12 c
" Hay Rope....⅌ ℔ 11 c

Rules.	Boxwood	Ivory.
Chapin's, Standard, Stanley	dis 70 &10 %	dis 60 &10 %
Stephens	65&10 %	50&10 %
Willis, Thrall & Son	60&10 %	50&10 %

Sad Irons.
From 4 to 10 lbs....⅌ ℔ 2¾c net
Self Heating....⅌ doz $9.00 net
" Tailors'....⅌ doz $18.00 net
Gleason's Shield and Toilet....dis 25 %
Enterprise Patent Cold Handle....dis 33⅓ %
Mrs. Pott's Pat. Cold Handle, "Crown"....dis 33⅓ %
Combined Fluter and Sad Iron..per doz $15.00, dis 15 %
Sand Paper.
Baeder & Adamson's Flint, 00 to 1½..$4.25 ⅌ ream } dis 20@25 %
" " 2, 2½ & 3. 4.75 ⅌ ream
" " Assorted 4.25 ⅌ ream
" " Star.... 3.25 ⅌ ream
" " Emery..⅌ ream $6.50 @ 11.50
New England, same list as B. & A. Flint....dis 20@25 %
Gage's....dis 20&5 %
Sash Cord.
Common....⅌ ℔ 16 @ 13½c net
Patent....⅌ ℔ 18c net
Silver Lake Russia Flax....⅌ ℔ 55c, dis 10 %
" White Cotton....⅌ ℔ 55c, dis 10 %
" Drab Cotton....⅌ ℔ 60c, dis 10 %
Raw Hide....dis 25 %
Steel Ribbon....dis 10 %
Sash Locks.
Clark's, No. 1, $10.00; No. 2, $8.00 per gross....dis 50 %
Ferguson's....dis 33⅓ %
Walker's....dis 10 %
Hammond's Window Springs....dis 25 %
Northup Window Springs....$9.00 per gross, dis 10 %
The Perfect, Clark & Smith, Plain Jap'd ⅌ gro $10.00 net
" " Por.Knob Jap'd. ⅌ gro 14.00 net
" " Nickel-Plated... ⅌ gro 27.00 net
Sash Weights.—Solid Eyes....⅌ ℔ 1¼ @ 1⅜c
Sausage Stuffers or Fillers.
Miles....⅌ doz $20, dis 30 %
Perry....⅌ doz, No. 1, $15; No. 0, $21, dis 30&10 %
Draw Cut No. 4....each $30.00, dis 20 %
Enterprise Mfg. Co....dis 20 %
Silver's....dis 25 %
Saws.
Disston's Circular....dis 35 %
" Mill....dis 35 %
" Cross Cut....dis 25 %
" Hand, Panel, Rip, &c....dis 20 %
Boynton's Lightning, Cross Cuts, new list....dis 30 %
" One-Man, all lengths, "....dis 25 %
" Billet Webs, 30 in....⅌ doz $8 00, dis 30 %
Wheeler & Clemson Mfg. Co.'s Hand....dis 20 %
" " Cross-Cut....dis 35 %
Livingston's Butcher and Kitchen....dis 20 %
" Framed Wood—
Nos.... 101 102 103 104 105
Per doz..$10.00 [illegible] 10.00 7.50 5.25 net
Saw Frames.
White, Vermont....⅌ doz $1.35, dis 25 %
Red, Polished and Varnished....⅌ doz $2.00, dis 25 %
Saw Rods....$10 list dis. 10&10 %
Saw Sets.
Boynton's Patent....per doz. $10.00, dis 30 %
Stillman's Genuine....⅌ doz $3.38@$3.50 net
" Imitation....⅌ doz $3.25, dis 35 %
Common Lever....per doz $2.00, dis 35 %
Leach's....No. 0, $8.00; No. 1, $15.00, dis 15 %
Nash's....No. 1, $8.50; No. 2, $5.50, dis 20&10 %

Hammer, Hotchkiss ... $5.00, dis 15 %
" Bemis & Call Co.'s New Pat ... dis 40&5 %
Bemis & Call Co.'s Lever & Spring Hammer. dis 35&10 %
" " Plate and Cross Cut ... dis 20 %
Aiken's Genuine ... $13.00, dis 50 %
" Imitation ... $7.00, dis 55 %
Hart's Patent Lever ... dis 20 %
Disston's ... dis 20 %

Scales.
Batch, Counter, No. 171 ... ₩ doz $36, dis 45&10 %
" Tea, No. 101 ... ₩ doz $15.00 dis 55 %
Union Platform ... $6.00, dis 55 %
Turnbull's Market ... dis 20 %
Fairbanks' ... dis 20&5 %
Howe's ... dis 20&5 %
Chatillon's Grocers' ... dis 40 %
" Eureka ... dis 20 %
Family Universal ... dis 45 %
" Favorite ... dis 40 %
" Turnbull's ... dis 25 %
Scale Beams, Chatillon's list ... dis 25 %
" Sargent's list ... dis 60&10 %

Scrapers.
Adjustable Box Scraper (S. R. & L. Co.), $6.50, dis 25&10 %
Box, 1 Handle ... ₩ doz $5.00, dis 10 %
" 2 " ... ₩ doz 6.00 dis 10 %
Defiance Box and Ship ... dis 25&10 %
Foot ... dis 70&10 %
Ship (common) ... per doz $3.00 net
" (Providence Tool Co ... dis 10 %

Screw Drivers.
Douglass Mfg. Co ... dis 35&10 %
Disston's ... dis 52½ %
Disston's Patent Excelsior ... dis 52½ %
Buck Bros ... dis 25 %
Stanley Rule & Level Co., Varnished Hdls. dis 50&10 %
" " Black Handles ... dis 40&10 %
Sargent & Co.'s ... dis 60&10 %

Screws.
Flat H'd Iron ... dis 60 %
Round Head Iron ... dis 45 %
Flat Head Brass ... dis 45 %
Round Head Brass ... dis 30 %
Brass and Silver Capped ... dis 40 %
Japanned, list of Plain Screws ... dis 55 %
Lag or Common Coach ... dis 60&5 %
Coach Patent Gimlet Point, List per 100 ... dis 60 %
Bed ... dis 10@10 %
Machine, Flat Head, Iron, Am. Screw Co ... dis 25 %
" Round Head, Iron, " " ... dis %
Bench, Iron ... dis 65&10 %
" Wood, Beech ... ₩ doz $3.00, dis 15 %
" " Hickory ... dis 20&10 %
Hand ... dis 25&10 %
Hand Rail, Sargent's ... dis 70&10 %
" " Humason, Beckley & Co s (low list) dis 40&10 %
Jack (Wilson's) ... dis 35 %
Sash (T. & S. Mfg. Co.) ... dis 25 %

Screw Window Balances.
R. B. Hugunin's, Single g o., $23.94; 5 gro., $22.68, dis 5 %

Shears and Scissors.
Cast Steel ... dis 80&10 %
" Iron, "American" ... dis 60 %
Seymour's Straight Trimmers ... dis 65 %
" Scissors ... dis 65 %
Pruning ... see Pruning Hooks and Shears.
Barnard's Lamp Trimmers ... ₩ doz $3.75
Tinners' ... dis 20 %
Heinisch Trimmers and Scissors ... dis 60&10 %

Sheaves.
Sliding Door, M. W. & Co., list ... dis 50&2 %
" R. & E. list ... dis 70&10&2 %
" Patent Roller ... dis 25&2 %
" " Hatfield's ... dis 70&10&2 %
" Russell's Anti-Friction ... dis 70&10&2 %
" Moore's Anti-Friction ... dis 45 %
Sliding Shutter, R. & E. list ... dis 50&2 %
" " Sargent's list ... dis 55&10 %
Moore's Anti-Friction (Hanging) ... dis 45 %
Philadelphia Hanging ... dis 40&5&2 %

Shovels and Spades.
Ames, New list Jan. 1, '79 ... dis 20 %
Hussey, Binns & Co., Patent ... dis 15 %
" " Association List ... dis 20&5 %
Old Colony ... dis 30 %
Remington's (Lowman's Patent) ... dis 30 %
Dunning's Shovels and Scoops ... dis 20&7½ %
B. Rowland's "Regular." ... dis 60 %
" Patent ... dis 40&5 %
Oxford Patent ... dis 40&5 %

Shovels and Tongs.
Iron and Brass Head, R. & E. list ... dis 65 %
Polished Steel ... new list, dis 50&10&2 %

Slates.
Square Frames, Round Cornered, by case ... dis 70 %
Less than a case ... dis 65&10 %

Spoke Shaves.
Defiance Metallic ... new list, dis 25&10 %
Iron ... dis
Wood ... dis 30 %
Bailey's (Stanley R. & L. Co.) new list ... dis 25&10 %

Spoke Trimmers.
Ponney's ... ₩ doz $10.00, dis 40&10 %
Stearn's ... ₩ doz $10.00, dis 40 %
Ives' ... No. 1, $15.00; No. 2, $12.00 ₩ doz, dis 50&10 %
Douglass' ... ₩ doz $0.00, dis 20&10 %

Spoons.
Tinned Iron ... dis 40&5 %
Basting ... dis 40&5 %
Britannia ... dis 65 %
Derby Silver Co ... dis 40&5&5 %
L Boardman's Sons, A1 ... dis 40&5&5 %
Rogers & Bro., A 1 ... dis 40&5 & 5 cash
Rogers Cutlery Co ... dis 40&5&5 %
Reed & Barton ... dis 40&5 %
Hall & Elton ... dis 40&5 %
Holmes, Booth & Haydens ... dis 40&5 %
German Silver ... dis 30&10&5 %
Cast steel, Sil. Plated ... dis 33⅓ %
Diamond Steel (L. Boardman's Sons) ... dis 30&5 %
Tin (P. S. & W.), Teas ... $1.25 ₩ gross, net
" " Tables ... $2.00 ₩ gross, net
Tin Cowles Hdw. Co.) ... dis 10 %
" " case lots ... dis 20 %

Stocks and Dies.
"Lightning" Screw Plate ... dis. 10 %

Stone.
Hindostan Stone ... ₩ ℔ 6c } dis 33⅓
" Ax Stone ... ₩ ℔ 8c }
" Slips ... ₩ ℔ 10c } &10 %
Sand Stone ... ₩ ℔ 6c, dis 33⅓&10 %
Washita Stone ... No 1. ₩ ℔ 18c net
" ... No 2. ₩ ℔ 15c net
" Slips ... No. 1, ₩ ℔ 42c net
Washita Stone (Boyd & Chase) ... No. 1 ₩ ℔ 15c net
Turkey Oil Stone (Boyd & Chase) ... 4 to 8in, $1.00 ₩ ℔, dis 10 %
" Slips ... $2.50 ₩ ℔, dis 10 %
Lake Superior (Boyd & Chase) ... ₩ ℔ 20c, dis 10&5 %
" Slips " ... ₩ ℔ 45c, dis 10&5 %
Grindstones, Family, Loring's ... dis 10 %

Stove Polish.
Joseph Dixon's ... ₩ gross $6.00, dis 10 %
Gem ... ₩ gross $4.50, dis 5 %
Gold Medal ... ₩ gross $6.00, dis 25 %
"Mirror" ... ₩ gross $6.00, dis 5 %
Ruby ... ₩ gross $3.75, net
Rising Sun ... ₩ gross $5.75, net
Dixon's Plumbago ... ₩ ℔ 8c. net

Squares.
Steel ... dis 50 %; full cases, dis 50&10 % } 2 %
Iron ... dis 50 %; full cases, dis 50&10 % } cash
Nickel Plated ... add $2.50 @ $4.00 ₩ doz, net
Try Squares and T Bevels ... dis 50&10 %
Star Try Squares and Bevels ... dis 35 %
Disston's Try Squares and T Bevels ... dis 52½ %
Winterbottom's Try and Mitre ... dis 25&10 %

Tacks, Brads, &c.
List of May, 1878 ... dis 55 %
Tinned Carpet ... dis 50&30 %
Shoe Nails, (new list) ... dis 10 %
Double-Pointed Tacks ... dis 40&5 %

Tap Borers.
Common and Ring ... dis 20&10 %
Ives' Tap Borers ... dis 10&10 %
Enterprise Mfg. Co ... dis 20 %

Tapes, Measuring.
American ... dis 25 %
Spring Tapes ... dis 25&10 %

Thermometers.
Tin Case ... dis 70 %

Tobacco Cutters.
Enterprise Mfg Co. (Champion) ... dis 20 %
Wood Bottom ... ₩ doz $12.00, dis 40@45 %
All Iron ... ₩ doz $10.50, dis 50&5 %
Nashua Lock Co.'s ... ₩ doz $18.00, dis 50 %
Toe Calks.—Winsted ... ₩ ℔ 10c. dis 10 %

Tinners' Tools and Machines.
Machines (P. S. & W.) ... dis 5@10 %
Tools (P. S. & W.) ... dis 15@20 %

Traps.
Game, Newhouse ... dis 33⅓ %
" Newhouse Pattern ... dis 60&10 %
" Blake's Patent ... dis 50 %
Mouse, Wood, Choker ... ₩ doz holes, 12c
" Round Wire ... ₩ doz $1.50, dis 10 %
" Cage ... ₩ doz $2.50, dis 10 %
" Catch-em-alive ... ₩ doz $2.75, dis 10 %
Rat, "Decoy" ... per doz $10.00, dis 10 %

Trowels.
Lothrops Brick and Plastering ... dis 25 %
Reed's Brick and Plastering ... dis 15 %
Disston's Brick and Plastering ... dis 20 %
Peace's Plastering ... dis 30 %
Clement & Maynard's ... dis 20 %
Rose's Brick ... dis 15 %
Brades' Brick ... dis 20 %
Worrall's Brick and Plastering ... dis 20 %
Garden ... dis 55 %

Triers.
Butter and Cheese ... dis 25%

Vises.
Solid Box ... List. of July 1, '79, dis 35 %
" "Crown" (A. H. Hildick) 4 to 100 ℔, 15c dis 20 %
" Peter Wrights ... 15½c
Parallel, Parker's ... dis 20 %
" Wilson's ... dis 50 %
" Howard's ... dis 25&10 %
" Merrill's ... dis 20 %
" Sargent's ... dis 66⅔&10 %
" Trenton ... dis 25 %
" Backus and Union ... dis 25 %
" Fisher & Norris ... dis 15&10 %
" Stevens' ... dis 25 %
" Simpson's Adjustable ... dis 25&10 %
"Family." List ... net
Saw Filers, Bonney's ... ₩ doz $24.00, dis 20&10 %
" Stearn's ... dis 20&10 %
" Hopkins' ... ₩ doz $17.50 dis 10 %
Lowell Hand Vises ... dis 20 %
Richardson's Vise and Anvil ... dis 25 %

Ventilators.
Protective (upper) per foot, $1.00 } dis %
" (lower " 1.50 }

Washer Cutters.
Smith's Patent ... ₩ doz $12.00 dis 10 %
Johnson's ... ₩ doz $12.00, dis 35 %
Penny's ... ₩ doz $14.00 and $16.00, dis 45 %
Appleton's ... ₩ doz $8.00, dis 20&10 %
Washers.—See Nuts and Washers.

Weather Strips.
Protective Ventilator Co. s ... dis 25 %

Well Wheels.—Revised list ... dis 60&10 %

Wire.
Brass and Copper ... List of July 1, 1878 dis 25@30 %
Bright and Annealed ... Nos. 0 @ 18. dis 55 @ 57½ %
" " ... Nos. 19 @ 26, dis 62½ @ 65 %
" " ... Nos. 27 @ 36, dis 65 @ 67½ %
Coppered ... Nos. 0 @ 18, dis 50 @ 52½ %
Galvanized, Nos. 0 to 6 ... ₩ ℔ 10c, dis 37½ @ 40 %
" Nos. 7 to 18 ... market list, dis 37½ @ 40 %
Tinned, Nos. 0 to 18 ... dis 42½ @ 47½ %
Cast Steel ... dis 25 @ 30 %
Tinned Broom Wire, Nos. 18 to 25 ... dis 57½ @ 60 %
Annealed Fence, Nos. 8 and 9 ... dis 55 @ 57½ %
" Grape, Nos. 10 to 14 ... dis 55 @ 57½ %
Galvanized Telegraph, Nos. 7 to 9 ... ₩ ℔ 8½c
" " Nos. 10 and 11 ... ₩ ℔ 9½c
" No. 12 ... ₩ ℔ 10c
Fence Staples ... ₩ ℔ 6 @ 6½c
" Staples, Galvanized ... 9 ... ₩ ℔ 7 @ 7½ c
Stubs Steel Wire ... $7.00 to £ gold
Japanned Barb Fence ... ₩ ℔ 11½c
Galvanized " ... ₩ ℔ 12½c
Steel Music Wire, Nos. 12 to 27 ... ₩ ℔ $1.00, net
Judd's Picture Wire ... dis 80&20&10 %
Clothes Line Wire, Galvanized ... ₩ coil 30 @ 40c net
Green Wire Cloth, per sq. foot, 3c @ 3¼c ... net

Wrenches.
American Adjustable ... dis 45 %
Baxter's Adjustable "S," ... dis 20 %
" Diagonal ... dis 20 %
Collins & Co.'s ... dis 45 %
Coes' Genuine ... dis 65 %
" "Mechanics" ... dis 65&10 %
" Pattern, Malleable ... dis 75&10 %
Girard Standard ... dis 70 %
Girard Agl ... 75 %
Davis' Patent Duplex ... new list, dis 25 %
Bemis & Call's Patent Combination ... dis 25 %
" " Merrick's Pattern ... dis 40&5 %
" " Briggs' Pattern ... dis 35 %
" " Cylinder or Gas Pipe ... dis 25&30 %
Van Wagoner & Williams' Basin ... per doz $4.50
Aiken Pocket (Bright) ... $6.00, dis 55&10 %
The Favorite Pocket (Bright) ... per doz $8, dis 60 %
Webster's Pat. Combination ... dis 35 %

Wringers. Per doz.
Peerless, No. 0, no Cogs ... 51.00
" No. 1, " ... 54.00
" No. 2½, with Cogs ... 60.00
" No. 2, " ... 63.00
" No. 3, " ... 71.00
" No. 4, " ... 93.00
Unique, No. 0 ... 51.00
" No. 1 ... 54.00
Universal, XX No. 2½ ... 60.00
" " No. 2, ... 63.00
" " No. 1½ ... 71.00
" " No. 1 ... 93.00
" " No. 8 ... each. 12.00
" " No. 12 ... " 20.00
" " No. 18 ... " 25.00
" " No. 22 ... " 32.00
Crown No. 2 ... 54.00
" No. 2½ ... 63.00
" No. 3 ... 69.00
Eureka, No. 1 ... 57.00
Novelty, No. 10, with Cog Wheels ... 60.00
" No. 2, " " ... 63.00
Excelsior, No. A, with Folding Bench ... 78.00
" No. E, for Set Tubs ... 66.00
Keystone No. 1, Wood Frame, no Gear ... 54.00
" No. 2, Iron " " ... 54.00
" No. 10, Wood " Common Gear ... 60.00

Stamped Tinware.—New List Dec. 1, 1878.
Common Stamped Ware ... dis 25 %
Stamped Deep and Retinned Ware ... dis 25 %

METALS.

IRON.—Duty: Bars, 1 to 1½c. ₩ ℔; Sheet, Band Hoop and Scroll, 1½ to 1⅞c. ₩ ℔; provided, that none of the above Iron shall pay a less rate of duty than 35 per cent. Pig, $7 ₩ ton; Polished Sheet, 3c. ₩ ℔; Wrought Scrap, $8 ₩ ton; Cast Scrap, $6 per ton. Railroad 70c. ₩ 100 ℔s. Boiler and Plate, 1½c. ₩ ℔.

Pig Iron—American Nominal.
Foundry No. 1 ... ₩ ton $22.00 @ 23.00
" No. 2 ... ₩ ton 21.00 @ 22.00
Gray Forge ... ₩ ton 20.00 @ 21.00

SCOTCH.
Eglinton ... nominal, ₩ ton 21.00 @ 21.50
Coltness ... ₩ ton 23.50 @
Gartsherrie ... ₩ ton 22.50 @
Glengarnock ... ₩ ton 22.00 @

Rails.
Iron ... ₩ ton $40.00 @ 42.00
Steel ... ₩ ton 49.00 @ 50.00
Old Rails ... ₩ ton 26.00 @ 27.00

Scrap.
Wrought Scrap, from yard .. ₩ ton, nom. 25.50 @ 26.00

Bar Iron, from Store.
Common Iron:
⅜ to 2 in. round and square ... } ₩ ℔ 2.3c
1 to 6 in. x⅜ to 1 in ... }
Refined Iron:
⅜ to 2 in. round and square ... } ₩ ℔ 2.4c
1 to 6 in. x⅜ to 1 in ... }
1 to 6 in. x¼ and 5-16 ... ₩ ℔ 2.7c
Rods—⅝ and 11-16 round and square ... ₩ ℔ 2.6c
Bands—1 to 6x3-16 to No. 12 ... ₩ ℔ 2.8c
Norway Bars ... 5c

Sheet Iron.

	Common American	R. G. American.
Nos. 10 to 20	₩ ℔ 3½c	4½
21 to 24	₩ ℔ 3¾c	4¾
25 to 26	₩ ℔ 4 c	5
27	₩ ℔ 4¼c	5
28	₩ ℔ 4½c	5

Galvanized, 14 to 20, B. B. ₩ ℔ 7⅛c; 2d qual. ₩ ℔ 6½c
" 21 to 24, " ₩ ℔ 8¼c; " ₩ ℔ 7¼c
" 25 to 26, " ₩ ℔ 8¾c; " ₩ ℔ 7¾c
" 27 " ₩ ℔ 9¼c; " ₩ ℔ 8¼c
" 28 " ₩ ℔ 9¾c; " ₩ ℔ 8¾c
Patent Planished ... ₩ ℔ A. 10½c; B, 9½c
Russia ... ₩ ℔ Nos. 8 to 14 ... @13c
American Cold Rolled ... ₩ ℔ 4½@5½c

COPPER.—Duty: Pig, Bar and Ingot, 5c; Old Copper 4c ℔; ₩ Manufactured (including all articles of which Copper is a component of chief value), 45 % ad valorem.
American Ingot ... ₩ ℔ See Trade Report.

SHEATHING, BRAZIERS' COPPER, BOLTS, &c.
Braziers' Copper, ordinary sizes, over 16 oz., ₩ sq. ft ... ₩ ℔ 26c
Braziers' Copper, ordinary sizes, 16 oz. and over 12 oz., ₩ sq. ft ... ₩ ℔ 27c
Braziers Copper 10 oz and 12 oz., ₩ sq. ft ... ₩ ℔ 29c
" Lighter than 10 oz. ₩ sq. ft ... ₩ ℔ 31c
Circles less than 84 in. in diameter ... ₩ ℔ 28c
Circles 84 in. diameter and over ... ₩ ℔ 31c
Segment and Pattern Sheets ... ₩ ℔ 27c
Locomotive Fire Box Sheets ... ₩ ℔ 20c
Sheathing Copper, over 12 oz. ₩ sq. ft ... ₩ ℔ 25c
Bolt Copper ... ₩ ℔ 26c
Copper Bottoms ... ₩ ℔ 26c
No Copper is Sheathing except 14x48 inches and not to exceed 34 oz. to the sq. ft.

TINNING.
14x48, by the case ... ₩ sheet 6c
14x48, less than case ... ₩ sheet 8c
For tinning both sides, double the above amount

O'NEILL'S PATENT PLANISHED COPPER.—Net.
14x48.
14 and 16 oz. and heavier ... ₩ ℔ 31c By the case. ₩ ℔ 30c
12 oz. and lighter ... ₩ ℔ 34c " " ₩ ℔ 33c
Boiler Sizes.
7 in., 14x52. 8 in., 14x56. 9 in., 14x60.
14 and 16 oz. and heavier. ₩ ℔ 33c By the case. ₩ ℔ 32c
(And all sizes not over 20 in. wide.)
30x60.
14 and 16 oz. and heavier ... ₩ ℔ 35c
12 oz ... ₩ ℔ 36c

Brass.
Brown & Sharp's Gauge the Standard for Metal; Old English Gauge the Standard for Wire.
BRASS MANUFACTURERS' PRICE LIST.—dis nominal.
July 1, 1878.
Cash prices for Roll and Sheet Brass. For less quantity than 100 ℔s. add 3c ₩ ℔.

HIGH BRASS.
All Nos. not thinner than to No. 28, wider than 2 in., not wider than 1, in ... 25c
All Nos. to No. 28, inclusive, and widths over 14 to 20 in., inclusive ... 30c
All Nos. to No. 28, inclusive, and widths over 20 to 30 in., inclusive ... 33c
½c. ₩ ℔ advance on each No. above Nos. 28 to 38, inclusive.
All Brass thinner than No. 38 is Platers' Brass, at ... 48c
Sheets 24x48, and all sheets cut to particular sizes and lengths under 30 in., in width wider than 2 in. 32c
Printers' Rules ... 40c
Sheets wider than 30 in. and under 40 in ... 42c
" 40 in. and over ... 45c
Circular Sheets, in diam. from 4 in. to 14, inclusive. 35c
" over 14 " 20, " ... 40c
" " 20 " 30, " ... 44c
" " 30 " 40, " ... 50c
" " 40 in ... 54c

LOW BRASS.
4c ₩ ℔ more than High Brass.
Gilding Metal, 8c ₩ ℔ more than High Brass.
Platers' or Gold Metal { In Bars ... 43c
Sawed ... 46c
Planed or Polished ... 49c

FOR SLITTING.
Metal in width 2 in. to ⅜ in. to No. 28, inclusive, 1c. ₩ ℔ advance.
Metal, in width 2 in to 1 in., thinner than No. 28, 2c. ₩ ℔ advance.
Metal, in width 1 in. to ⅛ thinner than No. 28, 3c ₩ ℔ advanc
Metal, in width ⅜ in. to ¼, inclusive, not thinner than No. 28, 2c. ₩ ℔ advance.
Metal, in width ⅜ in. to ¼ thinner than No. 28, 5c. ₩ ℔ advance.
Metal, ¼ in. in width and less, 10c. ₩ ℔ advance.
Any of the above widths cut to particular lengths, add 7c. ₩ ℔.

GERMAN SILVER MARKET METAL AND WIRE.

	Market Metal.	Wire.
4 per cent., 12 inch, to No. 26	$0.52	$0.70
6 " " "	56	76
10 " " "	64	.88
15 " " "	.74	1.03
18 " " "	.80	1.12

German Silver Sheets over 12 in. wide and weighing more than 10 ℔s., $2.00 ₩ ℔.
Advance 2c. for each additional inch in width above 12 in., and 2c. ₩ ℔ on each No. thinner than Nos. 26 to 36, inclusive
All German Silver thinner than No. 36 is Platers, at 50c ₩ ℔ additional.
German Silver Scrap one-half less than net price of 12 in. Market Metal. German Silver Turnings, Filings and Chips, half the price of Scrap.

BRASS COPPER AND WIRE.

	High Brass.	Low Brass.	Gild'g and Copper.
No. 0 to 20	$0.28	$0.32	$0.28
No. 21	.31	.35	.41
No. 22	.32	.36	.42
No. 23	.33	.37	.43
No. 24	.35	.39	.45
No. 25	.38	.42	.48
No. 26	.40	.44	.50
No. 27	.43	.47	.53
No. 28	.47	.51	.58
No. 29	.50	.54	.61
No. 30	.53	.57	.67
No. 31	.57	.61	.73
No. 32	.61	.65	.79
No. 33	.65	69	.88
No. 34	.69	.73	.98

Spring Wire 2c ₩ ℔ advance.
Flat, Square and Half Round Wire 5c ₩ ℔ advance on Round Wire.
Fancy Wire not less than 10c ₩ ℔ advance of Round Wire.
Brass Rods, No. 8 and larger not less than 2 feet lengths, 33c.
Wire straightened and cut, smaller than No. 8, and not less than 2 feet lengths, 38c.
Wire and Rods less than 2 feet lengths, special rates.
Twelve cents per ℔ extra for spooling on 1 ℔ spools.

MISCELLANEOUS.
Common Plain Brass Pail Ears ... $0.36
Brass Door Rail ... .38

SCRAP.—net.
High Brass Scrap ... 11c
Low " ... 13c
Gilding ... 15c
Turnings, Filings and Chips half the price of Scrap.
Terms—Net cash. Interest to be added after thirty days.

TUBING.—dis 10 % ₩ ℔
Plain to No. 20 inclusive, above ¼ in. to 3 in ... $0.38
" above 3 in ... .48
Nos. 21, 22, 23, two cents advance on List for each Number.
Nos. 24, 25, 26, four cents advance on List for each Number.
Above No. 26, special rates.
Plain, ¼ inch ... .65
" 3-16 " ... 1.05
" ⅛ " ... 1.55
All Mandrel Drawn Tubes, 5 cents advance on List Prices.
Fancy Tubing to No. 20 ... 45c
English, Scotch and Extra Patterns Fancy Tubing to No. 20 ... .50
Tubing Sawed or Cut 2 to 4 feet long, 2 cents advance on List.
Add to 2 cents ⅛ cent for each additional cutting under 2 feet.
All Mandrel Drawn Tubes under ⅜ in., 25 cents per pound advance.

ZINC TUBING.—net.
Plain ... .22
Fancy ... .28
Scotch and Extra Patterns ... .31

GERMAN SILVER TUBING.—dis 10 %
4 Per cent ... .75
6 " ... .85
9 " ... 1.00
12 " ... 1.15
15 " ... 1.20
16 " ... 1.35
18 " ... 1.45
20 " ... 1.55

STEEL.—Duty: Bars, Ingots, Sheets and Coils, valued at 7 cents ₩ ℔., or under, 2¼ cents; over, 7 cents, and not above 11, 3 cents ₩ ℔; over 11, 3½ cents ₩ ℔, and 10 % ad val. Railway Bars, 1¼ cents ₩ ℔. Railway Bars, in part Steel, 1 cent ₩ ℔. Provided, that Metal cemented, cast or made from Iron by the Bessemer or pneumatic process, of whatever form or description, shall be classed as

American Cast Steel.
Tool ... 15c
Spring ... 7c
Homogeneous ... 12½c
Boiler Plate ... 8c
Tire ... 4½c
Machinery (round and square) ... 9c
File ... 9c
Sheet ... 9c
Saw Plate, mill and mulay ... 11 @ 16c
" gang and X cut ... 14 @ 16½c
" circular as to size ... 13 @ 14c
... 18 @ 30c

English Steel.—
" Best Cast ... ₩ ℔ 15½c
" Extra Cast ... ₩ ℔ 16½c
" Round Machinery, Cast ... ₩ ℔ 10c
" Swaged, Cast ... ₩ ℔ 18c
" Best Double Shear ... ₩ ℔ 15½c
" Blister, 1st quality ... ₩ ℔ 13c
German Steel, Best ... ₩ ℔ 11c
" 2d quality ... ₩ ℔ 10c
" 3d quality ... ₩ ℔ 9c
Sheet Cast Steel, 1st quality ... ₩ ℔ 15½c
" 2d quality ... ₩ ℔ 14½c
3d quality ... ₩ ℔ 12½c

ANTIMONY ... 12 to 12½
LEAD.—Duty: Pig $2 ₩ 100 ℔s; old Lead, 1½c ℔ ₩; Pipe and Sheet, 2½c ₩ ℔.
American ... 4⅛c @ 4¼c
Bar ... 5c dis 10 %
Pipe ... 5½c, dis 10 %
Tin Lined Pipe ... 12c, dis 10 %
Sheet ... 6c, dis 10 %
Shot ... Drop 6¾c, Buck, 7¾, net
Chilled Shot ... 8c, net
Shot in lots of 2000 lbs ... dis 10 %

BABBITT METAL.
N. P. U ... ₩ ℔ 6 @ 70
A 20c; B, 16c; C, 12c.

TIN.—Duty: Plates, Sheets, Tagger and Terne, 1.1c ₩ ℔; Electro-galvanized Plates, 2c ₩ ℔; Manufactures of, not enumerated, 35 per cent. ad. val. Bars, Block and Pigs free. Banca, subject to duty of 10 per cent
Banca ... ₩ ℔ 20c
Straits ... ₩ ℔ 18
English ... ₩ ℔ 17½

TIN PLATES.
I C 10x14 / 14x20 } Prime Charcoal ... $6.50 @ 6.75
I C 12x12 " ... 6.75 @ 7.00
I X 10x14 / 14x20 } Charcoal ... 8.00 @ 8.75
I X 12x12 " ... 8.50 @ 8.75
D C 12½x17 ... 5.75 @ 6.00
D X 12½x17 ... 8.00 @
For each additional X add ... 2.00

COKE TIN PLATE.

	Best.	2d quality.	Ordinary.
I C 10x14 / 14x20	$5.75	5.50	5.25 @ 5.37½
I C 12x12	6.00	5.75	5.25 @ 5.50

TERNE PLATE.

	Prime Char.	2d qual.	Coke.
I C 14x20	@ 6.00	5.50 @ 5.62½	5.00 @ 5.25
I X 14x20	7.50 @ 7.75	....	
I C 20x28	12.00 @ 12.25	11.50 @ 11.75	10.00 @ 11.50
I X 20x28	@ 16.00	....	....
I C 20x200	@ 18.75	...	

I C 14x20 M. F. Brand ... $7.50
SOLDER ... No. 1, 100 @ 11c; No. 2, 9½c
SPELTER—Duty: in Pigs, Bars and Plates, $1 ₩ 100 ℔s.
American, cash ... 5¾ @ 6c
Bergen Port from Lehigh Ore ... 9c
Lehigh, on spot ... 9c
ZINC.—Duty: Pig or Block, 1.50 ₩ 100 ℔s. Sheet, 2½c ₩ ℔.
Sheet, Cask ... @ 7¾
" Open ... @ 8½

Paper Stock, Old Metals, &c

(Dealer's Selling Price.)

Canvas linen ... 4 @
White cotton, new ... 5½ @
" " No 2 ... 2¾ @
White linen rags, No. 1 ... 4 @
" " No. 2 ... 2 @ 2¼
Seconds ... 1⅝ @ 1¾
Mixed woolens ... 2½ @ 3½
Soft woolens ... 10 @
Gunny bagging ... 3⅝ @
Jute Butts ... 3 @ 3½
Kentucky bagging ... 4½ @
Waste paper and scraps ... @ 1
Rope cuttings ... 1⅝ @ 3
Kentucky bale rope ... 4 @ 4½
Grass rope ... 2¾ @ 3
Tarred shaking ... 1½ @
Hard White Shavings, No. 1 ... 3⅝ @
Soft " " No. 1 ... 3 @
White Shavings, No. 2 ... 2½ @
Mixed Shavings, part white ... 2¼ @
Imperfections, No. 2, best folded sheets ... 3¼ @
" No. 1, Heavy Stock ... 3½ @
Book Stock ... 2¾ @
" Heavy ... 3 @
" " Light ... 1½ @
Newspapers ... 1¾ @ 1⅞
Prints ... 1¼ @
Pure Manilas ... 1¾ @ 2¼
Bogus Manilas and Hardwares ... ¾ @ 1
Commons ... 40 @
Binders' Board Cuttings ... 80 @
Straw Board Cuttings ... 60 @
Woolen Tailor Clips ... 13 @ 14
Satinet " ... 2 @ 2½

Old Metal.
Copper, heavy ... 14 @ 14½
Copper Bottoms ... 12 12½
Yellow Metal ... 10 @
Brass, light ... 8½ @
" heavy ... 10½ @
Heavy Composition ... 13 @ 13½
Old Lead, solid ... 3⅝ @ 3¾
Tea Lead ... 3⅛ @ 3⅜
Zinc ... 3¼ @ 3½
Pewter No 1 ... 11 @ 11½
" No. 2 ... 8½ @
Wrought Iron ... per ton $21 00
Machinery Iron ... per ton $13.00 @ 14.00
Light Iron ... per ton 13 00
Stove Plate ... per ton 11.50
Grate Bars ... per ton 5.00

Paints, Oils, &c.

Paints.
Black Lamp, Coach Painters ... ₩ ℔ 20c
" " Ordinary ... 6c
" Ivory Drop, fair ... 12 @ 15c
" " best ... 23c
Black Paint, in oil ... kegs, 8c asst'd cans, 11c
Blue, Prussian, fair to best ... 40 @ 55c
" " in oil ... 35 @ 45c
Blue Chinese dry ... 83
" Ultramarine ... 18 @ 30c
Brown, Spanish ... 1¼c
" Van Dyke ... 10@12c
Carmine, 40 ... combination price
Green, Chrome ... 15 @ 23c
" " in oil ... 14 @ 18 @ 25c
" Paris ... good 25c; best, 30c
" " in oil ... " 30c; " 45c
Iron Paint, Bright Red ... ₩ ℔ 2½c
" Red ... ₩ ℔ 2c
" Brown ... ₩ ℔ 1½c
" Purple ... ₩ ℔ 3c
" Ground in Oil, Bright Red ... ₩ ℔ 5½c
" " " Red ... ₩ ℔ 5c
" " " Brown ... ₩ ℔ 4½c
" " " Purple ... ₩ ℔ 6c
Mineral Paints ... 1¼ @ 4c
Orange Mineral ... 11c
Red Lead, American ... 6c
" " English ... 9½c gold
" Venetian (N. C.) dry ... $1.65 @ $1.70
" " in oil ... asst'd cans, 11c; kegs, 8c
" Indian dry ... 9 @ 12c
Rose Pink ... 10 @ 13c
Sienna, American, Raw ... 4c
" Burnt ... 4½c
" " in oil ... 10 @ 16 @ 20c
" Raw " ... 11 @ 15 @ 25c
Umber, Burnt ... 4 @ 8c
" " in oil ... 9 @ 12 @ 16c
" Raw ... 3½ @ 7½c
" " in oil ... 10 @ 16 @ 18c
Vermillion, Chinese ... 90c
" English ... 55 @ 57½c
" Trieste ... 1.10c
" American, Common ... 15c
White Lead, American, pure dry ... 6 to 7c
" " " in oil ... 7c to 7⅛c
White, Paris, English, prime ... in bbls. 2 @ 2½c
Yellow Ochre, French ... $1.75
" " " in oil ... asst'd cans, 11c; kegs, 8c
" " Vermont ... in casks 1½c
Yellow Chrome ... 17 @ 27c
" " in oil ... 14 @ 18 @ 24c
Zinc White, American No. 1, dry ... 7c
" " No. 1, in oil ... 9c
" French (Paris) ... 8 @ 10c
" " in oil ... @ 10c

Oils.
Linseed, Raw, in casks and bbls ... ₩ gal. 63c & 64c
" Boiled " " ... " 68c & 69c
Bleached Whale ... ₩ gal. 47c
" Sperm ... ₩ gal. 92c
" Elephant ... 61c
Signal ... 40c
Prime Lard ... 47c
No. 1 ... 45c
West Virginia ... 12c @ 18c
Drilling ... 38c
Empire Cylinder ... 65c
Miners' Oil ... 30 to 38c
Fish Oil, pressed ... 31c
Neatsfoot ... 65c
Tallow ... 60c
Machinery ... 40c
Engine ... 60c

Sundries.
Asphaltum ... [illegible]
Benzine ... ₩ gal. [illegible]
Chalk ... [illegible]
" Block ... [illegible]
Dryer, Patent, Am'n ... ass't cans, 10½c; keg, [illegible]
Frostings ... 50c
Glue, White ... 33 @ [illegible]
" Sheet ... [illegible]
Glaziers' Points, Zinc ... [illegible]
Gum, Copal ... 35c
" Damar ... 25c
" Shellac, English ... [illegible]
" " dark ... [illegible]
Litharge, English ... 9c g[illegible]
Mineral Wool ... ₩ ℔ 1¼ @ 1½c
Pumice Stone, selected Lumps ... 4 @ [illegible]
" powdered ... 2½c
Putty, in bladders ... 2¼c
" in bulk ... [illegible]
Rotten Stone, soft, English ... [illegible]
Spirits Turpentine ... 28c
Whiting Spanish ... [illegible]

Glass.
FRENCH WINDOW GLASS.
Prices current per box of 50 feet.

Single Thick.—Discount 60&20 %

SIZES.	1st.	2d.	3d.	4th
6 x 8 to 10 x 15	$8.00	$6.75	$6.25	$5.75
11 x 14 to 16 x 24	8.75	8.00	7.50	7.00
18 x 22 to 20 x 30	11.25	10.50	9.75	8.75
15 x 36 to 24 x 30	12.75	11.50	10.00	
26 x 28 to 24 x 36	13.50	12.25	11.25	
26 x 36 to 26 x 44	14.75	13.75	11.75	
26 x 46 to 30 x 50	16.25	15.00	13.00	
30 x 52 to 30 x 54	17.25	16.00	13.50	
30 x 56 to 34 x 56	18.75	16.75	15.00	
34 x 58 to 34 x 60	19.50	18.00	16.00	
36 x 60 to 40 x 60	21.00	19.50	18.00	

Double Thick.—Discount 70&10 %

SIZES.	1st.	2d.	3d.	4th.
6 x 8 to 10 x 15	$12.00	$11.00	$10.00	$9.25
11 x 14 to 16 x 24	14.75	13.75	12.75	11.75
18 x 22 to 20 x 30	19.00	17.75	16.00	
15 x 36 to 24 x 30	21.50	19.25	16.50	
26 x 28 to 24 x 36	23.00	20.75	18.25	
26 x 36 to 26 x 44	25.00	23.00	19.25	
26 x 46 to 30 x 50	27.00	25.00	21.25	
30 x 52 to 30 x 54	28.50	26.00	22.25	
30 x 56 to 34 x 56	30.00	27.75	24.75	
34 x 58 to 34 x 60	31.75	30.00	27.00	
36 x 60 to 40 x 60	35.50	32.50	30.25	

Sizes above 40 x 60—$10.00 per box extra for every five inches.
An additional 10 per cent. will be charged for all Glass more than 40 inches wide. All sizes above 52 inches in length, and not making more than 81 united inches, will be charged in the 81 united inches bracket

Steel.

R. H. WOLFF & CO.,

MANUFACTURERS, IMPORTERS, EXPORTERS & GENERAL MERCHANTS

MANUFACTURERS OF

CAST STEEL WIRE for all Purposes, Special Wire, Market Steel Wire, Prime Coppered Spring Wire, and of all Kinds of Furniture Springs, &c.

Importers of IRON & STEEL, WIRE RODS, &c

Sole Agents for COCKER BROS., Limited, Sheffield, England.

MANUFACTURERS OF

Cast Steel, Wire, and "Meteor" Wire Plates.

Sole Agents for "PR. HOMO" Dec. Cast Steel, Gun Barrels, Moulds and Ordnance.

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F. W. MOSS,

Successor to JOSHUA MOSS and GAMBLE BROS.

80 JOHN ST., NEW YORK.

STEEL AND FILES,

Hammers, Anvils, Vises, Blacksmiths' Tools.

WARRANTED CAST STEEL. Specially adapted for Dies, Punches, Turning Tools, Drills, &c.

ALSO, THE WORLD-RENOWNED

IMPROVED MILD CENTERED CAST STEEL.

Specially adapted for Taps, Reamers, Milling Tools, &c. *Warranted not to crack in hardening Tools of any size.*

SHEET, GERMAN, MACHINERY, SPRING AND EVERY OTHER DESCRIPTION OF STEEL.

Phila.—J. S. Watson & Son, Agents, 512 Commerce St.,

Franklin Works, Wadsley Works, Walkley Works, Sheffield, England.

MILLER, METCALF & PARKIN,

Pittsburgh, Pa.,

Manufacturers of

CRESCENT STEEL,

In Bars, Sheets, Cold-Rolled Strips, &c.

Polished, Compressed Drill Rods and Wire,

Warranted equal to any imported in *quality, finish and accuracy.*

Also Common Grades.

Established 1810.

J. & RILEY CARR,

SHEFFIELD, ENGLAND.

Manufacturers of the "Celebrated

"DOG BRAND" FILES.

Also of Superior

STEEL

For Drills, Cold Chisels, Tools, Taps, Dies, &c.

COLD ROLLED STEEL for Clock Springs, Corsets, &c.

SHEET CAST STEEL for Springs, Saws, Welding and Stamping Cold, &c.

GERMAN, MACHINERY, ENGLISH AND SWEDES SPRING STEEL,

And all other descriptions for machinists and agricultural purposes.

Warehouse, 30 Gold Street, New York.

Near John Street. HENRY MOORE, Agent.

Cleveland Rolling Mill Co.,

Manufacturers of

BESSEMER STEEL

AND

Iron Rail and Fastenings,

SPRING STEEL

AND

WIRE OF ALL KINDS,

Steel Horse Shoes, Tire, Axles and other Forgings,

Boiler Plate, Galvanized and Black Sheet Iron, Corrugated Roofing and Siding of Siemens-Martin, Bessemer Steel and Iron.

All made from our own Lake Superior Ores. CLEVELAND, OHIO.

AGENTS FOR THE UNION STEEL SCREW CO.

H. CHISHOLM, President Cleveland, Ohio.

A. B. STONE, Vice-Pres., No. 52 William St., New York.

GEO. SANDERSON & CO.,

MANUFACTURERS AND

Importers of STEEL,

Removed to 30 Gold Street, New York.

Particular attention is paid to quality and temper for FILES, SAWS, EDGE TOOLS, TABLE and POCKET CUTLERY, TOOLS, TAPS and DIES; also for COLD ROLLED STEEL for CLOCK SPRINGS, CORSET CLASPS, &c.

A Large Assorted Stock of JOHN ROTHERY'S FILES always on hand.

Steel.

NEWARK STEEL WORKS.

BENJAMIN ATHA & CO.,

Manufacturers of

BEST REFINED CAST STEEL

And grades of Steel specially adapted for Lathe Tools, Chisels and Taps and Dies.

Warranted most superior for TOOLS AND GRANITE ROCK DRILLS.

A full assortment of this universally approved OLD BRAND and other Steels for sale by

EDWARD FRITH & SON, Agents,

No. 241 Pearl St., New York.

LABELLE STEEL WORKS.

SMITH, SUTTON & CO.,

MANUFACTURERS OF ALL KINDS OF

STEEL.

Also Springs, Axles, Rake Teeth, &c.

OFFICE & WORKS, Ridge, Lighthill & Belmont Sts., & Ohio River, Allegheny.

Post Office Address, Pittsburgh, Pa.

Represented at Boston by WETHERELL BROS., 21 Oliver St.; at Milwaukee by JOHN PRITZLAFF, 43 to 49 West Water St.; at Chicago by S. D. KIMBARK, 80 to 84 Michigan Ave.

ALBANY & RENSSELAER IRON & STEEL CO.,

Troy, N. Y.,

Office in New York City, 56 BROADWAY.

MANUFACTURERS OF

Bessemer Railway Steel,

MERCHANT BARS, TIRE AND SHAFTING,

Railroad Iron, Pig Iron, Merchant and Ship Iron,

AGENCIES IN BOSTON AND PHILADELPHIA.

D. G. GAUTIER, Chairman. D. J. MORRELL, Treasurer. CHAS. DOUGLASS, Gen'l Supt.

GAUTIER STEEL CO., LIMITED,

STEEL,

WIRE and SPRINGS.

WORKS,

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Eastern Warehouse, 93 John St., N. Y.; Phila. Warehouse, 515 Commerce St.

FRANCIS HOBSON & SON,

97 John Street, NEW YORK,

Sole Manufact'rs of "CHOICE" Extra Cast Steel.

Manufacturers of all Descriptions of Steel.

Manufacturers of Every Kind of Steel Wire.

Don Works, Sheffield, England.

CHAS. HUGILL, Agent.

S. & C. WARDLOW,

Sheffield, England,

Manufacturers of the Celebrated

Cast and Double Shear

STEEL.

In Bars, Sheets and Coils, for fine Pen and Pocket Cutlery, Table Knives, Mining Tools, Dies, Files, Clock and other Springs, and Tools of every variety.

Warehouse, 95 John Street, New York.

WILLIAM BROWN, Representative.

FOREST CITY STEEL CO.,

Manufacturers of Best Quality

Crucible Steel for Drills, Taps, Dies, Tools, Mill Picks, &c.

Testimonial of D. J. Jones, Roll Turner, Cleveland Rolling Mill Co.

"I have been tecting the steel on chilled iron rolls along with the best English and American steels, and find it superior to any of them in every respect."

Samples furnished for trial. Quality guaranteed equal to any.

No. 13 Detroit Street, Cleveland, Ohio.

Steel.

R. MUSHET'S

Special Steel

FOR

LATHES, PLANERS, &c.

Turns out at least double work by increased speed and feed, and cuts harder metals than any other Steel. Neither hardening nor tempering required.

Sole Makers,

SAMUEL OSBORN & CO.,

Sheffield, England.

Represented in the United States by

RANDALL & JONES,

10 Oliver Street, BOSTON.

STEELINE.

Used for refining and tempering all kinds of Steel Tools.

Increases their durability at least fivefold.

Secures absolute safety from cracking.

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Of all description.

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The most popular Powder in use.

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Nos. 1 (coarse) to 4 (fine), unequaled in strength, quickness and cleanliness; adapted for Glass Ball and Pigeon Shooting.

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Nos. 1 (coarse) to 3 (fine), burning slowly, strong and clean; great penetration; adapted for Glass Ball, Pigeon, Duck and other shooting.

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A quick, strong, clean Powder of very fine grain for Pistol shooting.

DUPONT'S RIFLE, Fg, "Sea Shooting,"

FFg and FFFg.—The Fg for long range rifle shooting, the FFg and FFFg for general use, burning strong and moist.

Also all kinds of Sporting, Mining, Shipping and Blasting Powders of all sizes and descriptions. Special grades for export. Also, Musket, Cannon, Mortar and Mammoth Powder, U. S. Government standard. Powder manufactured to order of any required grain or proof. Agencies in all cities and principal towns throughout the U. S. Represented by

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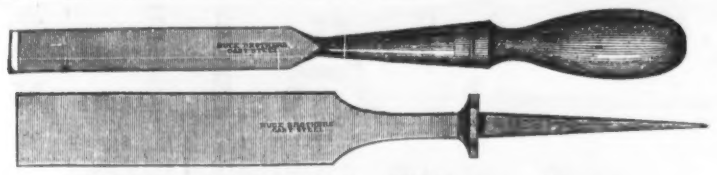

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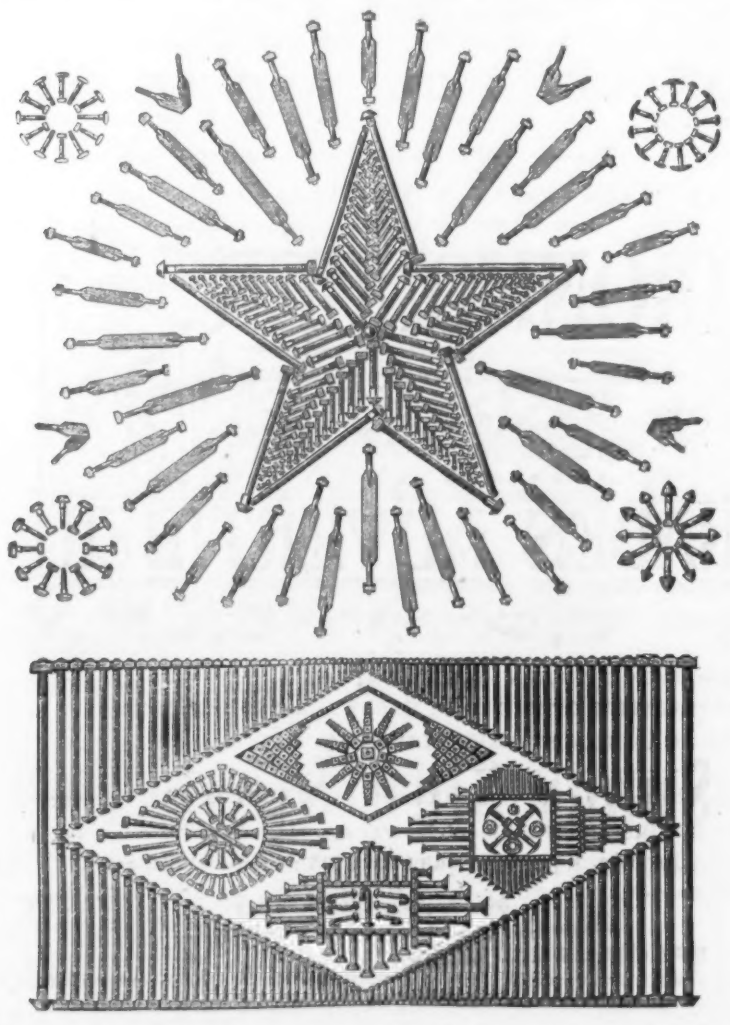

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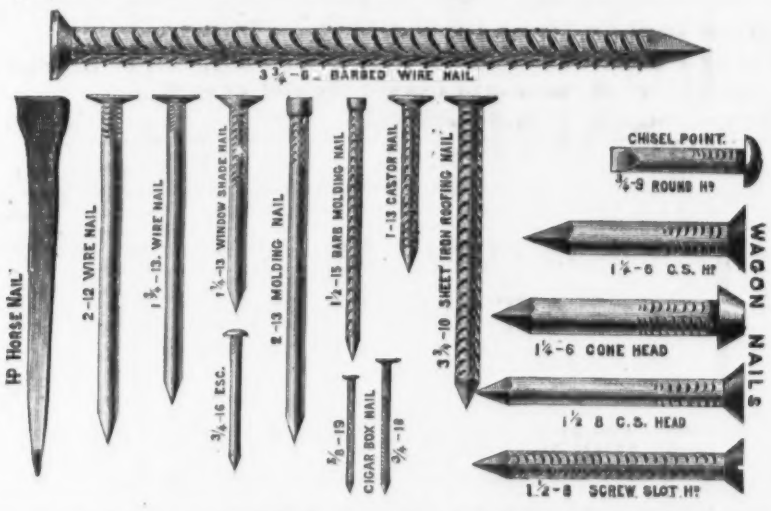

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Steel, Iron and Brass Nails and Barbed Nails

Of every kind.

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Manufactured by

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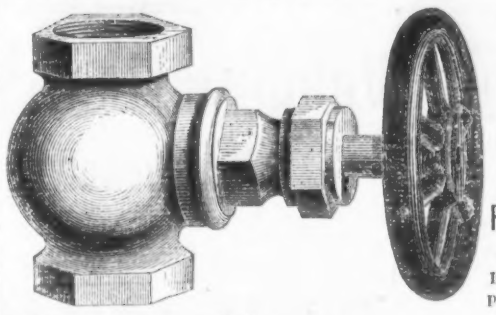

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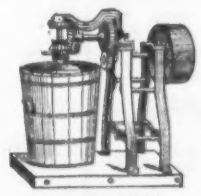

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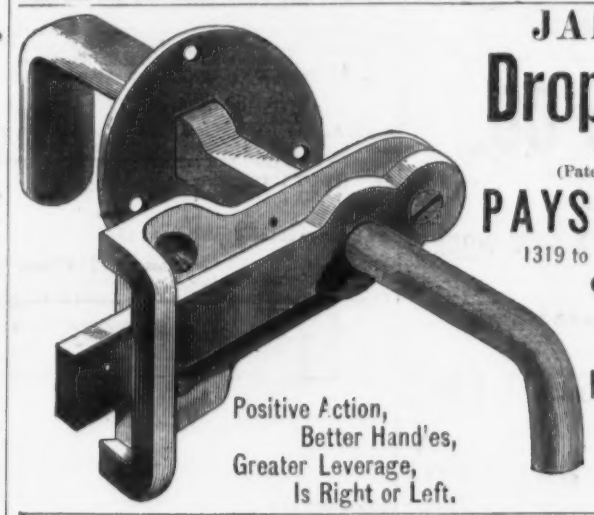

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Positive Action,
Better Hand'es,
Greater Leverage,
Is Right or Left.

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WEYMOUTH'S PATENT.

This knife is the best in use for cutting down hay and straw in mow and stack, cutting fine feed from bale, cutting corn stalks for feed, cutting peat and ditching marches.

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They are nicely packed in boxes, one dozen each, of 50 lbs. weight, suitable for shipping by land or water to any part of the world.

Manufactured only by

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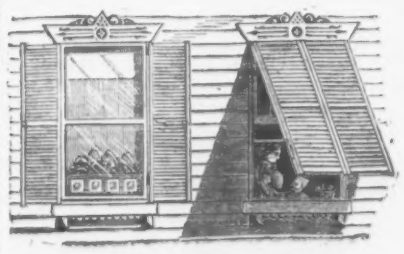
For sale by the Hardware Trade generally.

Dearborn's Pat. Adjustable Blind Awning Fixtures.



Either old or new Blinds thus fitted can be opened in the usual way or used as an awning at pleasure.

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THE "OLD RELIABLE"

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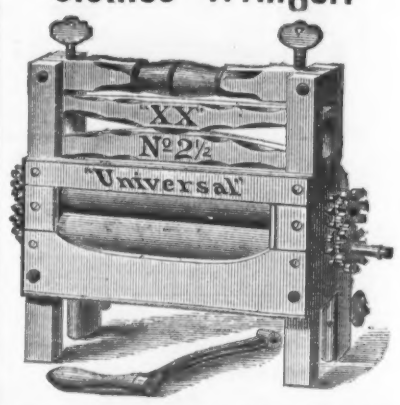
Clothes Wringer.



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Over 500,000 sold!

And now in use, giving "Universal" satisfaction

EVERY WRINGER WARRANTED.

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Sold by the **Principal Jobbers in Hardware and House-Furnishing Goods** everywhere.

☞ Special rates given for export.

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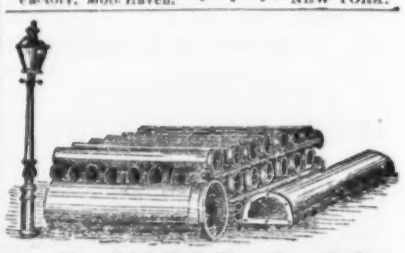

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FOR WATER AND GAS.

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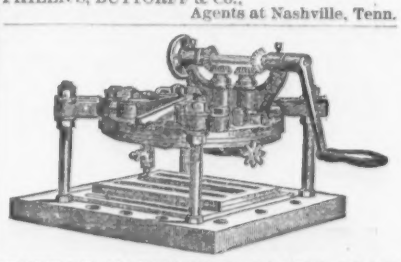

PATENT PORTABLE VALVE SEAT ROTARY PLANING MACHINE.

Manufactured by the

L. B. Flanders Machine Works,

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Descriptive Circular on application.

VERMONT SNATH CO.,

Manufacturers of

Pat. Swing Socket Snaths

and also a large variety of other styles of Snaths

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(Corrected weekly by Lloyd, Supplee & Walton).

Terms, 30 days. For 60 or 90 days, interest added at 10 per cent. per annum.

Anvils.
Peter Wright's, ₩ lb. gold.....10½c
over 250 lbs.....11c net
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Apple Parers.—per doz ₩ 5 00 net
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Peach Parers.....
Lit le Favorite, corer and slicer..... " 7 50 net
Lots of 10 to 25 dozen special price.

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Mann's Red Warrior .....Per doz. $8 00 @ 8 50 net
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Crown Prince..... " 8 50 @ 9 50 net

Augers and Auger Bits.—
Bates' Nut Augers.....dis 50 @ 55 %
Cook's Augers.....dis 50 @ 55&5 %
Watrous Ship Augers.....dis 15 %
Benjamin Pierce Auger Bits.....dis 40 %
Griswold Auger bits.....dis 50 @ 55 %
Cook's " " .....dis 50 @ 50&5 %
Jennings' " " .....dis 10&10 %
Bonney's Pat. Hol. Augers, list $16 ₩ doz...dis 25&10 %
Scrorns' Pat. Hol. Augers " $48 " ...dis 25&10 %
"Common".....dis 25&10 %

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Bevin Bros. Mfg Co. Light Hang Bells.....dis 70 @ 75 %
Swiss Pattern Hand Bells.....dis 50 @ 55&10 %
Connell's Door Bells.....dis 50 @ 50&10 %
Gt. Western & Kentucky Cow, new list. ...dis 50&10 %

Bolt and Rivet Clippers.
Chambers' No 1, for ⅝ bolt, each ...$ 7 50
" " ½ " " ... 9 00 } dis. 25 %
" " ⅜ " " ... 12 00 }

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Upright, with Augers.....List $9 00 dis 40&10 %
" without Augers ..... " 5 50 dis 40&10 %
Angular, with Augers..... " 11 00 dis 40&10 %
" without Augers..... " 7 00 dis 40&10 %

Bolts.—Eastern Carriage Bolts .....dis 55&5 %—cash
Philadelphia " " .....dis 70 %
Stanley, Wrought Shutter.....dis 50 %

Braces.—Barber's.....dis 40&5 %
Backus.....dis 50 @ 50&10 %
Spofford.....dis 50&5 %
American Ball.....dis 35 %

Butts.—Cast Fast Joint, Narrow.....dis 60&10 %
" " Broad.....dis 65&10 %
Cast Loose Joint, Narrow.....dis 70&10 %
" " Broad.....dis 70&10 %
" Acorn, Loose Pin.....dis 70&10 %
" Acorn " Jap'd.....dis 75&10 %
Mayer's Loose Joint.....dis 70&10 %
Wrought Loose Pin.....dis 50 %
" Table Hinges and Back Flaps.....dis 45 %
" Narrow, Fast.....dis 50 %
" Loose Joint.....dis 50 %

Blind Butts.
Parker.....dis 75&10 %
Clark.....dis 75&10 %
Shepard.....dis 75&10 %
Lull & Porter.....dis 66⅔&10 %
Huffer's.....dis 33⅓ @ 33⅓&10 %

Chains.—German Halter and Coil.....dis 40 @ 40&10 %
Galvanized Pump.....₩ lb 10c net
Best Proof Coil Chain—(English).
₩ lb.....11½ 8¼ 7¾ 7¼ 8⅛ 8½ 7c gold
8-16 ¼ 5-16 ⅜ 7-16 ½ ⅝ in.

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Socket Firmer.....dis 65, 5&10 %
Butcher's.....$5 00 to £ gold

Casters.—Bed .....dis 50&10 %
Plate.....dis 50&10 %

Coffee Mills.—Box and Side.....dis 25 %
Enterprise.....dis 20 %

Cutlery.—Wallen Pocket .....dis 25&8 % cash
Landers', Frary & Clark, J. Russell & Co., Lamson & Goodnow Mfg. Co. and Meriden Cutlery Co., Manufacturers' prices net

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Hart Mfg Co.'s.....dis 65, 5&10 %
Adjustable Handle.....dis 20 %

Fry Pans.
Tinned.....dis 50&10 @ 60 %
₩ doz..$3 50 4 00 4 50 5 00 5 50 6 50 7 50 9 00 10 00
No..... 0 1 2 3 4 5 6 7 8
Burnished.....dis 60&5 %
₩ doz..$3 00 3 25 4 25 4 75 5 25 6 00 7 00 8 00 9 00
No..... 0 1 2 3 4 5 6 7 8

Files.
Nicholson.....dis 35 %
Disston.....dis 35
Butcher.....$1 50 £ gold
Spencer.....$4 50 @ 4 75 £ gold

Flaring Machines.
Eagle—3½ in. roll.....Each $1 62½ net
" —5½ in. roll..... " 2 12½ net
Crown—1¾ in. roll..... " 2 62½ net
" —6 in. roll..... " 3 00 net
" —8 in. roll..... " 5 00 net
Geneva Fluter.....dis 30 %
Favorite com. Fluter & Sad-Iron..₩ doz $30 dis 25&10 %

Hammers.
Perkins & Plumb's.....dis 20 %

Hatchets.
Perkins & Plumb.....dis 33⅓ %
Hunt.....dis 25 %

Hinges.
Strap and T.....dis 60&10 %

Horse Nails. Nos. 5 6 7 8 9 10
Aussable..... 30 27 25 24 23 22
" Polished & Fl'd and Fluted and Pointed 31 28 26 25 24 23
Globe.....Set 1st 26 23 21 20 19 18
Clinton..... 22 20 19 18 17
" Polished and Pointed 23 21 20 19 18
Southern, all sizes.....₩ lb 14c. net
Discount on Ausable and Clinton, 20 %; Globe, net.

Locks and Knobs.
Branford.....new list, dis 6⅔&10&2 % cash
Gaylord Cabinet.....dis 25&2 % cash
United States Lock Co.....dis 35 %
American Padlocks.....dis 25⅔, 5&2 % cash
Scandinavian Pad Locks.....dis 50&10 %
₩ doz..$4 50 5 00 6 50 7 00 9 50 1 00 12 50 }
No..... 57 58 59 60 61 62 63 } dis 50 %
₩ doz..... 8 00 10 00 } dis 50 %
No..... 64 65 66 }

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Square Candle and Oil.....₩ doz. $2 75 @ 3 00
Tubular.....No. 0 $6 50; No. 1, 12 50; ₩ doz. net
Guards 50 cents extra per doz. net.

Lawn Mowers.—Pennsylvania.....dis 3 &10
Philadelphia.....dis 3 &10
Excelsior.....dis 30& 0

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Holland Patent.....List 5.00 dis 20 %

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Long and Short Cutter.....₩ doz. $9 00 @ 9 50 net
Pennsylvania Pattern..... " 9 50 @ 10 00 net

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Enterprise Mfg. Co.'s Measuring Faucets.....dis 20 %
Stebbins' Gates.....dis 62½&10 %
Lincoln's " .....dis 62½&10 %
Landers, Frary & Clark's Petroleum.....dis 25&10 %
Brass Liquor Cocks.....dis 5 %
Cork Lined " .....dis 65 @ 65&10 %

Meat Cutters.—Dixon's.....dis 25 @ 30 %
Woodruff.....dis 25 @ 30 %
Stowe.....dis 25 @ 30 %
Hale's.....new list, dis 50&5 %
American.....dis 25 %
Stuffers.....dis 25 @ 30 %
Enterprise Stuffers.....dis 20 %

Planes.—Obi's Tool Co.....dis 35 & 10 %
Bailey.....dis 25&10 %
Sciota.....dis 50 %
Auburn.....dis 35 & 10 %
New York Tool Co.....dis 50 %

Plane Irons.—Ohio Tool Co.....dis 20 & 10 %
Buchner's.....gold £, $5 50

Plumbs and Levels.
Stanley's Adjustable.....dis 65&10 %
" non-Adjustable.....dis 65&10 %

Picks.—Philadelphia.....dis 40 %
Hunt's.....dis 25 %

Pumps.—Eickford.....$7 00, dis 30&10 %

Rules.—Stanley Boxwood.....dis 50&10 %
Stanley Ivory.....dis 60&10 %

Steelyards.—Hart's Pattern.....dis 60&10 %
₩ doz..... $14 50 17 75 21 00 26 50 31 00 35 50
Lbs..... 50 100 150 201 250 300
American Pattern.....dis 25 @ 25&10 %
₩ doz..... $5 50 7 00 9 00 11 00 13 00
Lbs..... 50 100 150 200 250 300
English Pattern.....dis 20 @ 25 %
₩ doz..... $7 00 8 67 10 67 12 67 14 67 16 67
Lbs..... 50 100 150 200 250 300

Squares.—
Steel and Iron.....dis 70 %; full case, dis 50&10 %
Try Squares, Stanley .....dis 50&10 %
Disston's Try Squares.....dis 50&10 %

Scythes.—Golden Clipper, Damascus Blade, Boxed and Sharpened.....₩ doz. $8 00 net
Clipper No. 10, Bronzed Blade Boxed and Sharpened.....₩ doz. $7 50 net
Clipper No. 5, Painted Red, Boxed and Sharpened.....₩ doz $7 25 net

Saws.—Disston's Hand, Panel and Rip.....dis 20 %
Disston's Circular.....dis 30 %
Cross-Cut No. 7, Plain Tooth..₩ ft., 45c net
" " Patent Tooth..₩ ft., 45c. net
" " Champion Tooth....₩ ft., 35c. net

Shovels and Spades.
Rowland.....dis 50&5 %
Oliver Ames & Sons, new list.....dis 20 %

Sad Irons.—4 to 10 lbs.....₩ lb., 2½ @ 2½c
Mrs. Potts' Patent.....dis 33⅓ %

Stone.—Arkansas Oil Stone.....₩ lb $2 00 net
Washita Extra..... " 38 }
" No. 1..... " 20 } dis
" " 2..... " 16⅔ } 10 %
" Slips..... " 45 }
" Axe..... " 20 }
Turkey Oil Stone No. 1..... " 16½c net
" " " 2..... " 10c net
" Axe Stone..... " 25c net
Hindostan Oil Stone No 1.....₩ lb 4 @ 4½c net
" Axe Stone..... " 5 @ 5½c net

Screws.
Flat Head Iron.....dis 60 %
" " Brass.....dis 45 %
Round Head Brass .....dis 45 %
" " Iron.....dis 30 %

Spoons.—
Plated.....dis 40 @ 40&5 %
German Silver.....dis 30&10 %
Britannia, Boardmans.....dis 65 %
" Parkers.....dis 65 %
Tinned.....dis 15 @ 20 %
" by case.....dis 20 %

Springs.—Torrey.....₩ doz $2 00 @ 2 10 net
Philadelphia .....8 in., $3 00; 8½ in., $3 00 ₩ doz. dis 25 %
Chatfield.....No. 1, $3 50; 2, $3 00; 3, $6 00 ₩ doz. net
Gem Coil No. 1, Large Jap'd.....₩ doz $3 50 }
" No. 2, Medium Jap'd ..... " 2 50 } dis
" " No. 3 Small " ..... " 2 00 }

Stocks and Dies......dis 10&5 %

Stove Polish.—Gem.....₩ gross, $4 50, dis 5 %
Dixon..... " $6 00, dis 5 %
Onyx..... " $4 00 @ 4 25 net

Tacks, Brads, &c.—New List.....dis 55&10 %

Shoe Nails.—
4-8 and larger, 9c; 3½-8, 9½c ₩ lb New list, net
Double Pointed Tacks .....dis 40&5 %

Traps.
Genuine Oneida—Newhouse.....dis 33⅓ %
Im. Oneida—Newhouse list (1st qual.).....dis 60&10 %

Vises.—Solid Box, Trenton new list.....dis 35 %

Wrenches.—
Girard (Coe's Pattern).....dis 60&10&10&5 %
Girard Agl.....dis 70&10&5 %
Agricultural—
₩ doz 10 in., $3 60; 12 in., $5 40 net; case dis 5 %
Coes' Genuine.....dis 60&10 %
" Pat. Wrot Bar .....dis 60&10 %
" " Mall " .....dis 75&10 %
Taft's " Wrot " .....dis 75 @ 75&10 %
Phila. Tool Co., Duplex.....dis 25 %

Wire.—
Bright or Ann'd, No. 19 to 36 .....dis 60 %
" " No. 27 to 36.....dis 67½ %
" " No. 0 to 18 .....dis 62½ %
Coppered 0 to 18.....dis 55%
Tinned Broom Wire.....dis 55%
Galvanized, No. 7 to 18 .....Market list, dis 30 %

Wringers.—Novelty No. 10.....₩ doz. $60 00 net
Nove lty No. 2..... " 68 00 net
Universal, No. 2½..... " 60 00 net
" No 2..... " 68 00 net
Peerless, No. 2½..... " 60 00 net
" No. 2..... " 68.00 net

PITTSBURGH.

Merchant Iron.

Terms.—Note or acceptance at 60 days, with current rate of exchange on New York, or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice.

Flat Bar.
1½ to 4 by ⅝ to 1 inch.....2.5c
4¼ to 6 by ⅜ to 1 " 2.6c
1¾ to 6 by 1⅛ to 1¼ " 2.9c
1¾ and 1⅛ by ⅜ to ¼ " 2.4c
1 and 1⅛ by ⅜ to ¼ " 2.7c
⅝, ¾ and ⅞ by ⅜ to ⅝ inch.....2.9c

Heavy Bands.
3½ to 6 by ¼ and 5-16 inch.....2.7c
1½ to 3¼ by ¼ and 5-16 " 2.7c
1 to 1¾ by ¼ and 5-16 " 2.8c
⅝ to 1⅛ by ¼ and 5-16 " 3.0c
⅝ and ⅞ by ¼ and 5-16 " 3.5c

Light Bands.
3 to 6 by ⅛ to 3-16.....2.3c
3 to 6 by No. 11 and No. 12.....3.0c
1½ to 2¾ by ⅛ to 3-16.....3.0c
1½ to 2¾ by No. 11 and No. 12.....3.2c
1 to 1¾ by ⅛ to 3-16.....3.2c
1 to 1¾ by No. 11 and No. 12.....3.4c
⅝ and ⅞ by 1¼ to 3-16.....3.5c
⅝ and ⅞ by No. 11 and No. 12.....3.7c
⅝ and ¾ by ⅛ to 3-16.....4.0c
⅝ and ⅞ by No. 11 and No. 12.....4.2c

Hoop Iron.
⅝ and 9-16, Nos. 13 to 16.....5.2c
⅝ and 11-16, " 13 to 16.....4.7c
⅞ and 13-16, " 13 to 16.....4.2c
1 and 1⅛, " 13 to 15.....3.8c
1¼ to 2, " 13 to 15.....3.4c
⅝ and 9-16, " 17 to 20.....5.5c
⅝ and 11-16, " 17 to 20.....5.0c
⅞ and 13-16, " 17 to 20.....4.5c
1 and 1¼, " 16 to 19.....4.1c
1¼ to 2, " 16 to 18.....3.6c
2⅛ to 3½, " 13 to 15.....3.5c
1-10c ₩ lb extra for each gauge lighter than above indicated.

Rounds and Squares.
1 to 1¾.....2.5c | ⅝ to 9-16.....2.7c
2 to 2¾.....2.7c | ½ to 7-16.....2.9c
2¾ to 3¼.....3.0c | ⅜.....3.1c
3¾ to 4.....3.5c | 5-16.....3.3c
4¼ to 5.....4.0c | ¼.....3.5c
⅝ to ⅞.....2.6c | 3-16.....5.5c

Oval Iron.
⅞ to 2.....2.9c | ⅝.....3.3c
⅞ to ⅝.....3.1c | ⅜.....3.7c

Half Oval and Half Round.
⅞ to 2 inch .....3.2c | ⅝ inch.....4.0c
⅜ to ⅝ " .....3.7c | ⅞ " 5.5c

Horse Shoe.
⅝ to 1¼ by 5-16 to ⅞ inch.....3.5c
Wagon Box Iron.....4.0c
Juniata 30 ₩ lb over American.

Sheet Iron.

	Common.	Charcoal.	Juniata.
No. 10 to 14	3.3c	4.8c	6.3c
No. 15 to 17	3.5c	5.0c	6.5c
No. 18 to 21	3.8c	5.3c	6.8c
No. 22 to 24	4.0c	5.5c	7.0c
No. 25 & 26	4.2c	5.7c	7.2c
No. 27	4.4c	5.9c	7.4c
No. 28	4.8c	6.3c	7.8c

All sheets No. 18 and lighter, over 30 inches wide, not less than 2-10c extra.

Tank Iron.
5-16 to ½ in. thick.....3.3c
Plow Slabs.....3.5c
" Wings.....3.8c

Coal Screen Iron.
1¾ by ⅝ by 5-16.....3.0c | ½ by ⅝ by 5-16.....3.5c

Angle Iron.
2½, 3, 3½ and 4 inch.....3.3c
1½, 1¾, 2 and 2¼ " 3.3c
1¼ inch.....3.5c
1 " 3.8c
1¼ by 1 inch, for Plow Handles.....3.5c
1½ by ⅝ " " 3.5c
1⅜ by ¾ " " 3.7c

T Rail.
8 lbs. to the yard.....2.9c | 20 lbs. to the yard.....2.8c
12 " " .....2.8c | 28 " " 2.8c
16 " " .....2.8c | 30 " " 2.8c

Cast Chairs and Splice Joints for 12, 16 and 20 lb. Rail, 40c each; 28 and 40 lb. Rail, 50c each.
2½ by ⅝ and ½ Spikes for 20 and 28 lb. Rail.....3.7c
2½ and 3 by ⅝ " " 12 and 16 lb. Rail.....4.0c
2½ by 5-16 " " 8 lb. Rail.....4.1c

Flat Rails.—Punched and Countersunk.
1½ to 2 by ½ to ⅝ inch.....3.0c
1¼ by ⅝ and 7-16 inch.....3.2c
1¾ by ⅝, 7-16 and ½ inch.....3.5c

Juniata Nail Rods.....6.5c
Norway " 8.0c
Guard Iron, ¾x¾x⅝, and ¾x⅝x⅝.....5.5c
" ¾x⅝x9-16, and ¾x⅝x½.....6.0c
Drag Bars.....5.3c
Dropper Bars.....4.0c
Cylinder and Landside Iron.....3.2c
Plow Beam Iron.....3.0c

Wood's Patent Planished Sheet.
1st quality (A).....10½c | 2d quality (B).....9½c

Galvanized Iron—American.
Nos. 14 to 20.....12c | No. 27.....15c
Nos. 21 to 24.....13c | No. 28.....16c
Nos. 25 and 26.....14c | No. 29.....18c
Common and imperfect Juniata, 50 % off. Discount, 40&10 %.

Roofing Iron, Corrugated or Crimped.

Galvanized Common.		Black.	
No. 20	7c net cash	No. 20	3.8c
No. 21 & 22	7.3c "	Nos. 21 & 22	4.0c

Bridge Iron.
Carnegie Bros. & Co.'s list.
Beams and Channels.
Solid Wrought Iron Beams, 3 to 10¾ in. x30 ft..₩ lb 3¼c
" " " " 12 in. by 25 ft..... " 3¼c
" " " " 15 in. by 25 ft..... " 3¼c
Deck Beams, 7 to 9 in. by 30 ft..... " 3¼c
Channel Bars, 1¼ to 10 in. by 30 ft..... " 3.35c
" " 12 in by 30 ft..... " 3.35c
Tee Iron.
1 in. x1 in. to 5 in. x3 in.....₩ lb 3¼c
Angle Iron.
Equal Sided, 1x1 to 1⅝x1¾ in.....₩ lb 3.1c
" " 2x2 to 4x4..... " 3.0c
Unequal Sided, 2x1¾ to 5x4..... " 3.0c
Square Root Angles, 2x2 to 3½x3½..... " 3.0c
Star Iron, 1½x1¼ to 4x4..... " 3.1c
Sash Iron, 1¾x¾x3-16..... " 3½c
Miscellaneous Shapes, various shapes...₩ lb, 3.1 to 4.0c
Special prices for large lots.

Nails.
Brads and Fencing.
10d to 60d .....$2.35 | 4d and 5d $3.10
8d and 9d ..... 2.60 | 3d 3.85
6d and 7d ..... 2.85 | 2d 5.10
Barrel.
¾ in. .....6.35 | 1¼ in. 4.10
⅞ " .....5.35 | 1½ " 3.85
1 " .....4.85 | 1⅝ " 3.35
1¼ " 3.10
Finishing.
1 in. .....7.35 | 1½ to 1¾ in. 4.35
1¼ " .....6.35 | 2 in. 4.10
1⅜ " .....4.60 | 2½ " 3.85
3 " 3.60
Casing and Box.
10d to 30d .....3.10 | 6d 3.60
8d .....3.35 | 4d 3.85
Fine Blued. | 3d 4.85
4d .....4.10 | 3d 5.35
Lining. | 2d 6.10
⅜ in. .....6.85 | ¾ in. 8.35
Clinch—All sizes 4.10
Cut Spikes—All sizes 2.60
Boat Spikes—Cut 3.10
Slating.
5d .....3.35 | 20 .....4.10
4d .....3.35 | 20 .....4.35

Tobacco.
10d .....2.85 | 8d 3.10
6d to 7d 3.35
Each half keg 10 cents extra.

Terms.—Note or acceptance at 60 days; or a discount of 2 per cent. for cash, if remitted within 10 days from date of invoice. An abatement of 10 cents per keg allowed upon orders of 200 kegs or over.

Steel.
Square, Flat and Octagon Tool Steel.
⅜ to 2 in.....12c | 7-32 and 4⅛ 5 in.....15c
5-16 and 2½ to 3 in.....13c | 3 16 and 5⅛ to 6 in.....19c
¼ and 3⅛ to 4 in.....14c | 5-32 in.....23c
Single and Double Shear Nailers—Same as Tool.
Knife, Tap, Die, Mill Pick, Drill—Ordinary sizes.....12c
Machinery Steel—Round.
⅜ to 2 in.....7c | 7-32 and 4⅛ to 5 in.....10c
5-16 and 2½ to 3 in.....8c | 3-16 and 5⅛ to 6 in.....13c
¼ and 3⅛ to 4 in.....9c | 5-32 in.....18c
Cast Spring Steel.
1 to 4x1¼ to ⅛ in.....6c | 1⅛ to 3x5-32 to ½-16 in...7c
⅜ to 1⅜x5-32 to 3-16 in..8c
Agricultural Steels.
Solid Cast Steel Plow, 4 to 16 by 3-16 to ⅜ in.....6 c
"Iron Cast Plow," 4 to 16x3-16 to ¾ in.....7 c
"Iron Back Plow," 4 to 16x3-16 to ¾ in.....7½c
Soft Steel Center Plow, 4 to 16x3-16 to ¾ in.....9 c
Landside and Cultivator, C. S., ⅜ in. thick.....8½c
Circular Plow Coulters, 5-32 to ¼ in. thick.....10 c
Reaper and Scythe.....12 c
Fork and Hoe.....6 c
Horse Rake Teeth, tol ength.....7 c
Finger Bar.....7½c
Cutter Bars, C. S.....7½c
" " German Spring Steel.....6½c
Cornstalk Cutter beveled to length.....7 c
Planters' Hoe, C. S.....8 c
Hoe, C. S.....6½c
Sheet Steels.
German, 10 to 16 g.....7c | Common C'st, 17 to 20 g..9c
" 17 to 20 g.....10c | Best Cast, 10 to 16 g.....12c
Common C'st, 10 to 16 g. 8c | " 17 to 20 g.....13c

Rolls and Castings.
Furnace, Floor and Straightening Plates.....1½c
Housings and Castings not otherwise specified.....2½c
Guide Plates.....2½c
Spindles and coupling boxes.....1½c
Sand Rolls and Pinions, large size.....2½c
" small size.....3 c
Pipe Mill Castings.....4 c
Rolling Mill Castings under 50 lbs.....3 c
Spur and Bevel Wheels, large .....3 c
" small.....4 c
Pulleys up to 30 inches.....4 c
" over 30 inches.....3½c
Engine Castings, light.....3½c
" heavy.....3¼c
Chilled Rolls.
6 to 7 in. diam., 7 to 20 in. long.....5 c
8 to 15 in. " 8 to 40 in. " .....4 c
15 to 24 in. " 15 to 72 in. " .....4 c
24 to 31 in. " 72 to 108 in. " .....4 c

Horse Shoes, Etc.—In 100 keg lots.
Juniata Horse Shoes.....per keg, $3.50
Mule " " 4.50
" "Roadster" pattern " 3.75
Steel Toe Calks.....per 7½c lb.
Thistlewood & Co.'s Self-Sharpening Horse Shoes.....per keg, $5.25
Thistlewood & Co.'s Self-Sharpening Snow Shoes..... " 5.50
Toe Calks.....per lb. 8c

White and Red Lead.
White Lead in Oil, Assorted Kegs (all sizes).....7½c
" " 25 lb Tin Pails, 100 lb Cases.....8 c
" " 12½ lb Tin " " 8½c
Red Lead.....in kegs, 6¼c; in barrels, 6 c
Orange Mineral..... " 8¼c; " 8 c
Litharge..... " 6¼c; " 6 c
Dry White Lead, less than 500 lbs., 7¼c; over 500 lbs. 6¾c
White Lead in Oil in lots of less than 500 lbs., ¾c additional.
Terms: Note at sixty days, or if paid within 15 days from date of invoice, a discount of 1½ per cent. will be allowed, but not otherwise.

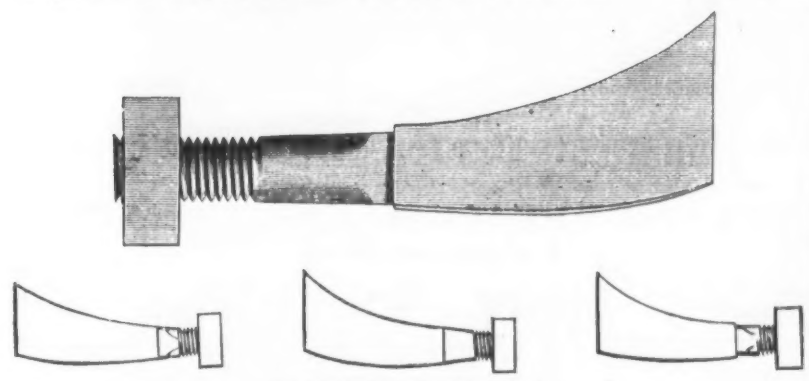
Window Glass.
Per Box of 50 Feet.—Discount 75 %.

Single Strength.

Size.	AA.	A.	B.	C.
6 x 8 to 10 x 15	$7.50	$6.75	$6.25	$5.75
11 x 14 to 16 x 24	8.50	7.75	7.25	6.50
18 x 22 to 20 x 30	10.75	9.75	8.75	7.75
15 x 36 to 24 x 30	12.25	10.75	9.00	
26 x 28 to 24 x 36	13.00	11.50	9.75	
26 x 36 to 26 x 46	14.50	13.25	10.75	
26 x 46 to 30 x 50	16.00	14.00	11.25	
30 x 52 to 30 x 54				
30 x 56 to 34 x 56				
34 x 58 to 34 x 60				
36 x 60 to 40 x 60				
Double Strength.				
6 x 8 to 10 x 15	12.00	11.00	10.00	25
11 x 14 to 16 x 24	13.75	12.50	11.75	10.50
18 x 22 to 20 x 30	17.25	16.75	14.00	
15 x 36 to 24 x 30	19.75	17.25	14.50	
26 x 28 to 24 x 36	21.00	18.50	15.75	
26 x 36 to 26 x 44	23.25	21.25	17.25	
26 x 46 to 30 x 50	24.00	22.50	18.00	
30 x 52 to 30 x 54	28.75	25.25	19.25	
30 x 56 to 34 x 56	27.75	25.00	21.75	
34 x 58 to 34 x 60	29.25	27.75	24.00	
36 x 60 to 40 x 60	33.25	30.00	27.75	

An additional 10 per cent. will be charged for all glass more than 40 inches wide. All sizes above 52 inches in length and not making more than 81 united inches, will be charged in the 84 united inches bracket.

THRESHING MACHINE TEETH



We manufacture all styles, such as

MASSILLON, BUFFALO PITTS,
ALTMAN & TAYLOR VIBRATOR,
CHICAGO PITTS,
SPRINGFIELD PITTS,
WOOSTER, VERMONT and
NEW YORK PATTERNS.

and others.

Send for Prices.

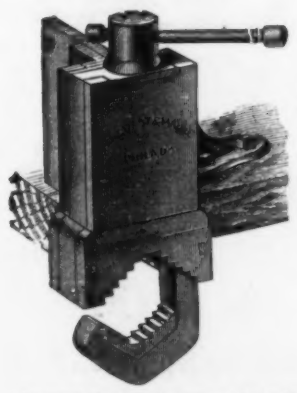
Providence Tool Co.,

PROVIDENCE, R. I.

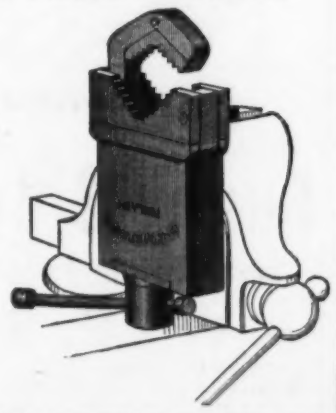
HENRY B. NEWHALL 11 WARREN ST. N NEW YORK AGENT.

Or to **J. H. Work, 13 Pearl St., Boston, Mass.; S. H. & E. Y. Moore, 68 Lake St., Chicago, Ill.; Henry B. Newhall, 11 Warren St., N. Y.**

IMPROVED PIPE-FITTERS' VISE.



STRONG,
LIGHT,
EFFICIENT,
CHEAP.



To meet the requirements of the large number of persons who have use for such an article, we invite attention to our Improved Pipe Vise. This Vise can be used either as a permanent fixture to work-bench, attached to angle plate or can (unlike others) be held between the jaws of any Machinist's or Blacksmith's Vise; the movable jaw being OPEN ON SIDE permits work to be gripped at any desired point without slipping it in from end, and allows of FITTINGS BEING HELD securely; the Box is made of Malleable Iron, the Screw of Wrought Iron, and the remainder of Solid Steel throughout. The Steel Gripping Jaws can be duplicated and replaced at any time when worn out. It is a very convenient tool, well adapted to the wants of Plumbers, Pump Fitters, Well-Drivers, and all who have use for a tool that is *strong, light, efficient and cheap* which can be readily carried about with kit of tools.

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PANCOAST & MAULE,

243 and 245 South Third Street, Philadelphia.

Wheeler, Madden & Clemson

MFG. CO.,

MIDDLETOWN, - - - - NEW YORK.

Manufacturers of

WARRANTED CAST STEEL

SAWS

Of every description, including

Circular, Shingle, Cross-Cut, Mill, Hand,

WOOD SAWS, Etc., Etc.

AMERICAN SAW CO.,

Manufacturers of

Movable Toothed Circular Saws,

PERFORATED CROSS-CUT SAWS

And SOLID SAWS of all kinds. Trenton, N. J.

HUNDLEY & HANKS,

PROPRIETORS OF

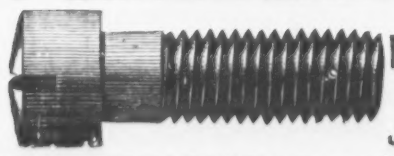
NORTH CAROLINA HANDLE CO.

MANUFACTURERS OF

Handles and Spokes,

79 Reade Street and 97 Chambers Street, - - - NEW YORK.

HARDWARE COMMISSION MERCHANTS.



TURNED
MACHINE SCREWS,

One-sixteenth to five-eighths diameter.
Heads and points to sample.
IRON, STEEL and BRASS.

JOHN FELLOWS,

(Successor to LYON & FELLOWS.) Factory and Office, *14 Dunham Place, Williamsburgh, N. Y.*

L. M. RUMSEY & CO.

MANUFACTURERS & JOBBERS OF

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LEAD PIPE & SHEET LEAD — GAS PIPE & FITTINGS

RAILWAY SUPPLIES,

PLUMBERS & STEAM FITTERS BRASS GOODS, — BELTING, HOSE, PACKING &C.

NO. 810. N. SECOND STREET, ST. LOUIS, MO.

Manufacturers of GALVANIZED PUMP CHAIN FOR CHAIN PUMPS.

PATENT

Expanding, Self-Draining
RUBBER BUCKET.

Manufactured only by
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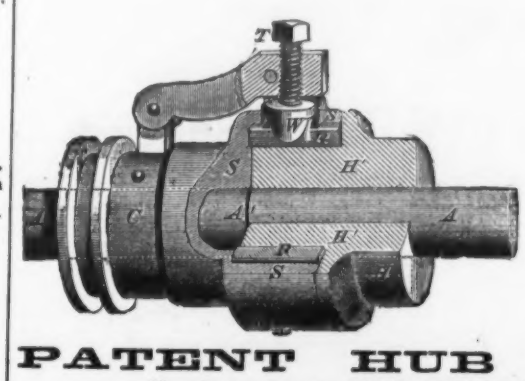

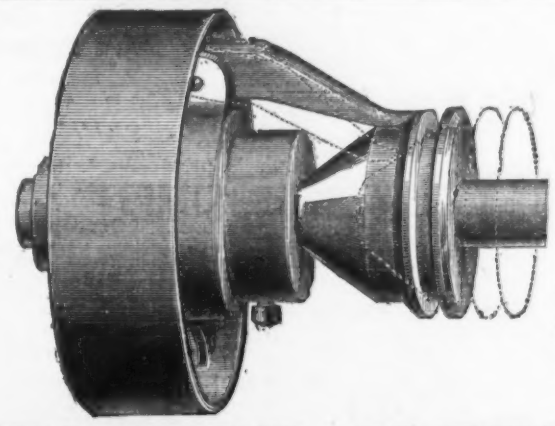

HUB FRICTION CLUTCH.

James Smith & Co., Mfg. Agents

PATENT HUB FRICTION CLUTCH.

Manufactured by the **HUB FRICTION CLUTCH CO., Limited, Philadelphia.**

We claim for this device the following advantages for a perfect clutch, it having been adopted by several of the leading manufacturers of machinery and machinists' tools: It works easily but effectively. It works instantly and without noise. It is very durable, and is extremely simple and cheap, and has proven itself to be the best clutch in the market. Special arrangements can be made with leading manufacturers for the adoption of this clutch for their own tools. This clutch can and will be sold for less money than any other clutch in the market.

For sale by GEO. V. CRESSON, Philadelphia; MORTON, REED & Co., Baltimore.

JAMES SMITH & CO., Mfg. Agents, 137 Market Street, Philadelphia.

H. S. MANNING & CO., NEW YORK AGENTS, 111 Liberty Street

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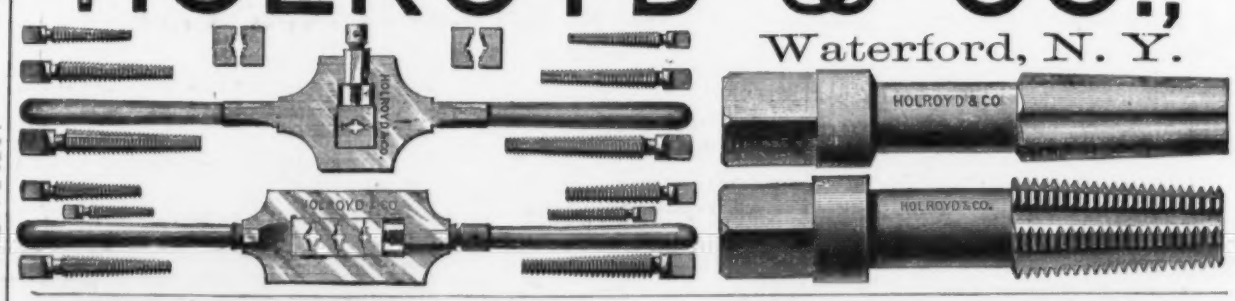
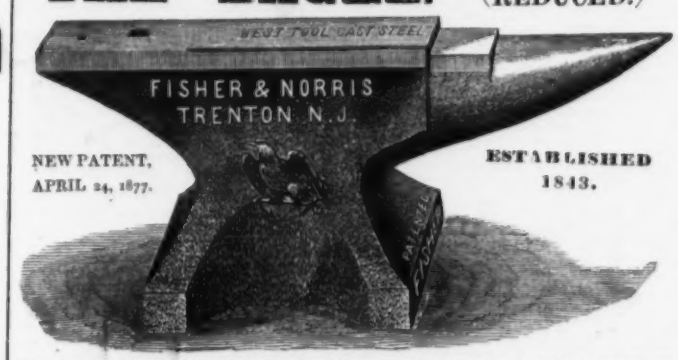


THE "EAGLE." (PRICES REDUCED.)



NEW PATENT, APRIL 24, 1877.

ESTABLISHED 1843.

WARRANTED!!

Better than the best English Anvil.

Face in one piece, of BEST TOOL CAST STEEL. PERFECTLY WELDED, perfectly true; of hardest temper and never to come off or "settle." Horn of tough *untempered steel*, never to break or bend. It does not bounce the hammer back, and therefore can do more work with lighter hammer. *Only Anvil made in United States fully warranted as above. None genuine without our trade mark.*

New Price List, April 1, 1879.

ANVILS weighing 100 lbs. to 800 lbs., 9 cents per lb., with special discounts to the trade.

SMALLER ANVILS ("MINIMS").

No.	00	0	1	2	3	4	5	6	7	8	9
Weighing about	5	10	15	20	30	40	50	60	70	80	90 lbs.
	$2.25	2.75	3.25	4.00	4.50	5.25	6.00	6.50	7.25	8.00	

N. B.—These are the RETAIL PRICES. The only additional cost will be the freight to the purchaser's place of residence.

SOLD BY

New York—RUSSELL & ERWIN MANUFACTURING COMPANY, H. DURRIE & CO., TENNIS & WILSON.
Philadelphia—JAMES C. HAND & CO. Boston—GEORGE H GRAY & DANFORTH.
Baltimore—W. H. COLE & SONS, JOHN R. KELSO, Jr.
Louisville—W. B. BELKNAP & CO. Cincinnati—POST & CO. Cleveland—THE LAKE ERIE IRON CO.

PAT. "SCREW WINDOW BALANCES."

Retail Price, $1 per window (four balances).

Liberal Discount to the Trade.

Retain Medium and Light Window Sash at any point of opening, with large surplus holding power in reserve, available if required by drawing the adjusting screws. An acquaintance with the genuine merits of these goods, and their simple requirements in use will insure to them the favor of the user and applier.

A Mechanism Always Wanted,

and as easily applied to windows as the common sash pulley, rendering the use of boxed frames, cords, pulleys, and the perplexing task of hanging sash unnecessary.

Sashes are locked with a meeting rail lock, as with weights.

Sample set, 4 Balances, sent postage free upon receipt of $1.

For sale by the Hardware trade. Send orders, &c., to

ROBERT B. HUGUNIN,

Manufacturer of Screw Balances,
Wethersfield, Ct.

SPECIAL NOTICE.

The undersigned, in view of the International Exhibitions to take place in Australia, begs to inform his friends that he continues to make translations of Catalogues, Prices-current, Circulars, Correspondence, &c., from and into the

ENGLISH,
FRENCH,
GERMAN,
PORTUGUESE
and **SPANISH,**

and that he bestows special attention upon a strictly correct rendering of **Technical Expressions** in matters relating to **Machinery, Metallurgy, Hydraulics,** &c. The very best reference will be furnished from leading manufacturers in this city, Philadelphia and elsewhere, for whom he has translated. If desired, estimates will be procured for the setting up, electrotyping and printing of catalogues, &c., in the above languages.

C. KIRCHHOFF,

Metal Reporter of The Iron Age,

83 Reade St., New York.

No. 1.

NEW sizes Patent Malleable Iron Oilers, Nos. 2 and 3.

NEW pattern Heavy Screw Clamps; strongest in the market.

Send for Price List.

Malleable Iron Castings

Of superior quality, and Hardware Specialties in Malleable Iron made to order.

HAMMER & CO., Branford, Conn.

No. 2.

"THE BOSS" JACK-SCREW.

R. D. WYNN,

Windsor, Vt., U. S. A.,

Sole manufacturer of the above Screw. Indorsed by builders, railroad and mining men as the best screw jack in the market. Also manufactures Press Screws, Lard and Wine Presses, Tackle Blocks, &c. Circulars and prices, address as above. (Please say *The Iron Age.*)

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Manufacturers of SAND & EMERY PAPER & EMERY CLOTH.

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Ground Emery, Corundum & Flint, Glue & Curled Hair, Hair Felt, & Felting for Covering Boilers, Pipes, &c., Cow Hide Whips.

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Reported by Macomber, Bigelow & Dowse, 156 to 164 Oliver St.

Anvils.—"Eagle American".....₱ lb 9c. dis 20 %
Apple Parers.—Reading Turn Table.....₱ doz $4.00
Goodell Turn Table....." 5.50
" Improved Turn Table & Push-off " 7.50
" Lightning....." 6.40
Hudson's Turn Table and Push-off....." 6.50
Aiken's Tools.....dis 40&10 %
Anvil & Vise.—
No. 1, $4.50; 2, 3.75; 3, 3.00 each.....dis 25 %
Augurs & Bitts.—Snell's Auger.....dis 50 %
L'Hommedieu's Shio Augers.....dis 15 %
Jenning's Bitts.....dis 10&10&10 %
Cook's Bitts.....dis 40 %
Shepardson's Double-Cut Bitts.....dis 50 %
" " Gimlets.....dis 50 %
Stearn's Extension Hollow Augers.....per doz $30.00
Bonney's " " " per doz 33.00
Pierce's Bitts.....dis 45 %
Griswold " .....dis 50 %
Axes.—Blue Jackets.....per doz 7.50
Red Cross.....per doz 7.00
" Handled.....per doz 9.00
Dowse " Boys'.....dis 15 %
Ax Handles.—
Oak Extra, 31 in., No. A.....₱ doz $2.25
" 34 in., No. A.....₱ doz 2.50
" 31 in., No. B.....₱ doz 1.75
" 34 in., No. B.....₱ doz 2.00
" 31 or 34 in., No. C.....₱ doz 1.25
Axle Clips.....dis 65 %
Balances.—Chatillon's.....dis 25&10 %
Barn Door Rail.—
Cast Angle (for Anti-Friction Hangers).....per ft. 3c
" Half-Round.....per ft, ⅜, 2½c; ½, 4½c
Wrought " .....per ft, ⅜, 3½c; ½, 4c; ¾, 5c
Bells.—Connel's Crank Going.....dis 40&10 %
Bird Cages.
Japanned M. B. & D., reduced list, 1879.....dis 33⅓ %
Brass " " 1879.....dis 25 %
Blind Fasts.—Lock Fasts.....₱ C sets $4.00
No. 6 Fasts.....₱ C sets 4.00
Veazie Fasts.....₱ C sets 6.50
Shedd's.....₱ C sets 7.00
Blind Hinges.—Mall. Hook, 3 holes.....₱ C sets 6.00
Brad Awl Handles.—
Phœnix Adjustable.....₱ doz $2.00
Bolts.—Norway Iron Carriage.....dis 75&10 %
Common " .....dis 75&10 %
Borax.—Refined.....₱ lb 10c
Boring Machines.—Eagle Upright.....each, $2.75
Eagle Angle.....each, 2.50
Snell Augers.....₱ set 1.00
Braces.—Barber's.....dis 40& 5 %
Spofford's.....dis 50&5 %
Backus'.....dis 65 %
Bracket Saws.
Bracket Saws, extra quality, to No. 6.....₱ gro $0.75
Steel Frame, with patterns.....₱ doz 7.50
Lester.....dis 25 %
New Rogers, all iron.....each, $2.25
Bracket Saw Blades.
Griffith's patent, all numbers.....₱ gross 75c
Brackets.—M. H. & B. Flower Pot.....dis 50 &10 %
Bronzed Sheet, M. B. & D. list.....dis 25 %
Bronze Hardware.—Norwalk Lock Co.dis 50&10 %
Butts.—Union Fast Joint.....dis 50 & 10 %
" Loose " .....dis 65&10 %
" Japanned Acorn.....dis 70&10 %
" Silvered " .....dis 70&10 %
" Boston Finish.....dis 75&10 %
Union Spiral Spring.....dis 25 %
Carriage Jacks.
"Climax," No. 1.....₱ doz $18.00
" No. 1½....." 13.00
" No. 2....." 12.00
"Universal".....dis 25 %
" No. 1.....each, $2.00
" No. 2....." 3.00
" No. 3....." 6.00
" No. 4....." 6.00
" No. 5....." 6.50
Cartridges.—U. S. Cartridge Co.....dis 60&10 %
Cards.—Watson's makeHorse and Curry.dis 33⅓&10 %
" Cotton.....dis 25&10 %
" Wool.....dis 25&10 %
Casters.—Bed and Table.....dis 65&10 %
Chain.—Traces 6½, 10, 4, straight.....₱ pair 40c
" 6½, 10, 4, twisted.....₱ pair 45c
" 7, 12, 2, " .....₱ pair 75c
Coil 3-16.....₱ lb 10c
" ¼.....₱ lb 7½c
" 5-16.....₱ lb 6½c
" ⅜.....₱ lb 5½c
" 7-16.....₱ lb 5c
" ½.....₱ lb 5c
Chalk.—White, Carpenter's.....₱ gross 15c
Red, Carpenter's.....₱ gross 75c
Blue, " .....₱ gross 90c
Chisels.—Hart, Bliven & Mead, Framing.....dis 70 %
Underhill, Framing.....dis 25 %
Buck's Shank, Framing.....dis 30 %
Clothes Line.—
Galvanized Wire, 100 feet each.....₱ doz $4.00
Coal Hods.—Ironclad.—Galvanized.....dis 25 %
Japanned.....dis 25 %
Copper Rivets......dis 50 %
Cocks.—Brass, L. F. & C.....dis 50 %
Cordage.—Manila, usual trade dis 10.....₱ lb 13 c
Jute.....₱ lb 9c
Cow Ties......dis 40 %
No. 20, 3 ft. No. 6 Wire, with toggle.....₱ doz $3.00
No. 3½, 3 ft. " " with snap.....₱ doz 3.80
No. 40, 3½ ft. " " with toggle.....₱ doz 3.90
No. 45, 3½ ft. " " with snap.....₱ doz 4.10
No. 50, 4 ft. No. 4 " with toggle.....₱ doz 4.50
No. 55, 4 ft. " " with snap.....₱ doz 4.75
No. 60, 4½ ft. " 3 " with toggle.....₱ doz 5.50
No. 65, 4½ ft. " " with snap.....₱ doz 5.62
Crow-Bars., Cast Steel.....₱ lb 7c
Iron, Steel Pointed.....₱ lb 4½c
Cutlery.—Pocket, American Shear Co.'s.....dis 40 %
Butcher Knives, "Woods," Lap Bolster, Square Handle.....dis 33⅓ %
Steak Knives.....dis 20 %
Lap Bolster, Oval Handle.....dis 25 %
Sticking.....dis 33⅓ %
Skinning.....dis 33⅓ %
Butcher, Common Round Handle, "Woods".dis 25%
Shoe Knives, " Woods".....dis 10 %
Dividers.—Cook's.....dis 25 %
Dog Collars.....dis 20 %
Dog Muzzles.—Automatic.....dis 15 %
Door Springs.—Torrey's Rod.....₱ doz $1.75
Gem Coil.....dis 20 %
Crown.....₱ doz $1.25
Warners.....₱ doz $2.25
Door Stops.—"Thurston's".....dis 50 %
Drawer Knobs.—"Thurston's".....dis 50 %
Drills.—Morse Bit Stock.....dis 25 %
Morse Straight Shank.....dis 20 %
Emery.—Wellington Mills.....₱ lb 10c
Alden's.....₱ lb 6c
Enameled Ware.
Standard Mfg. Co. Kettles.....dis 50 %
" Sauce Pans.....dis 40 %
Felloe Plates.—Wrought.....₱ lb 7c
Files.—Madden & Cockayne.....dis 35 %
American File Co.....dis 40 %
Nicholson " .....dis 35 %
Fitting Machines.
Knox, with 6 inch rolls.....₱ doz $36.00
Geneva.....₱ doz 13.50
Rochester.....₱ doz 12.00
"Princess".....₱ doz 24.00
Forks. W. C. & Co., Manure.....dis 40&10 %
Gimlet Bits.
Genuine German, No. 125, 1-32 to 8-32, per doz $1.00
Pierce's.....per doz 75c
Glass Cutters.
Combination Class Cutter and Knife Sharpener.....₱ doz $1.00
Grub Hoes.—K. P. & Co.'s No. 2.....₱ doz 7.50
Hammers.—Maydole's.....dis 15 %
Hammond's.....dis 15 %
Hangers & Rollers.—Anti-Friction.....dis 60&10 %
Climax.....dis 50&10 %
Novelty.....dis 40 %
Common.....dis 50&10 %
Hand Screws.....dis 20 %
Hatchets.—Dis. 15 %
Underhill.....dis 30 %
Hay Knives.—Lightning.....₱ doz $18.00
Hinges.—Strap and T (new list).....dis 60&10 %
Providence Plate.....₱ lb 4c
Wrought Screw Hook.....₱ lb 4c
Hoes.—W. C. & Co.'s.....dis 40&10 %
Hooks and Staples.—Brewers'.....dis 50 %
Horse Nails. No. 6 7 8 9
National Finished..... .23 .21 .20 .19....dis 25 %
Putnam Pointed..... .23 .21 .20 .19.....10 %
Horse Nails.—Bridgewater.....dis 25 %
No. 6, 23; No. 7, 21; No. 8, 20; No. 9, 19.
Knobs.—"Norwalk."
Mineral.....₱ doz $0.65
Porcelain, Japanned Mtg.....₱ doz .80
" Por. Rose Nickel Mtg.....₱ doz 2.50
" Plated " " .....₱ doz 2.50
Silver Glass.....₱ doz 5.00
Bell Pulls.....₱ doz 6.00
Lanterns.—Tubulars, No. 0.....₱ doz 8.05
Railroad, Oil, No. 43.....₱ doz 8.00
Guarded, Oil and Candle, No. 28.....₱ doz 3.50
Triangular.....₱ doz 4.00
Hurricane.....dis 20 %
Lead.—Sheet.....₱ lb 6 c
Pipe.....₱ lb 5½ c
Locks.—Norwalk Lock Co. (reduced list)..dis 50&10 %
Eagle Cabinet.....dis 25 %
" Trunk.....dis 25 %
W. Wilcox & Co., Padlocks.....dis 33⅓&5 %
American Lock Co.'s Steel Key.....dis 33⅓ %
Metallic Sieves.—Mann's Patent.....dis 33⅓ %
Manure Forks.—W. C. & Co.....dis 40&10 %
Mattocks.—K. P. & Co., Long Cutter.....₱ doz $9.00
K. P. & Co., Short Cutter.....₱ doz 8.50
" Pick " .....₱ doz 9.00
Measuring Tapes.—Eddy's.....dis 20 %
Meat Cutters.—Miles' Challenge.....dis 30 %
Hale's.....dis 40 %
American.....dis 25 %
Money Drawers.—Tucker's Alarm.....₱ doz $22.50
Mouse Traps.—Delusion.....₱ doz 2.00
Nails.....₱ keg, rates 2.35
Oilers.—Zinc and Tin.....dis 50 %
Brass and Copper.....dis 50 %
Ox Bows.—Extra finished and varnished.....dis 10 %
1½ in., ₱ doz. pair..$5.75 | 2 in., ₱ doz. pair....$9.00
1¾ in., " 8.00 | 2½ " " 11.00
Padlocks.—W. Wilcox & Co.'s.....dis 33⅓&5 %
Miller's Brass.....₱ doz $9.00
Picks.—K. P. & Co., Adze Eye, 5 to 6 lb.....₱ doz 6.50
" " 6 to 7 lb.....₱ doz 7.00
Planes.—Greenfield Tool Co.....dis 40 %
N. Y. Tool Co.....dis 50 %
English Iron.....dis 30 %
Bailey's.....dis 20&10 %
Plated Ware.—Rogers & Bro.....dis 40&5 %
Pliers.—Vom Cleff & Co.'s.....Gold list 15 %
Dutton's Wire Pliers.....dis 33⅓ %
Plumb & Levels.—Stanley, R. & L. Co..dis 60&10 %
Pocket Knives.
American Shear Co.'s.....dis 33⅓&10 %
Potato Diggers.
W. C. & Co. reduced list.....dis 40&10 %
Pulleys.
Acme or Excelsior, 1¾ in.....per doz 180
" " 2 in....." 210
Pulley Blocks.....dis 40 %
Pumps.—Union Manufacturing Co.
Iron Cistern.....dis 50 %
" Pitcher Spout.....dis 50 %
Copper.....dis 30 %
Rivets.—Black.....dis 50 %
Carriage in 10 ℔ papers.....dis 35 %
Copper.....dis 50 %
Razor Strops.—Torrey's.....Full line
Rules.—Stanley.....Boxwood, dis 75c&10 %
" Ivory dis 60&10 %
Sadirons.—Common.....₱ lb 2½c
Laundry.....₱ lb 5c
Tailor's Geese.....₱ lb 5c
Enterprise, "Potts'".....dis 33⅓&10 %
Mrs. Potts' Large Polishing, Nickeled ₱ doz net $3.50
Sash Locks.—King & Hutchinson's, new list.dis 40 %
Hopkins & Dickinson's.....dis 40 %
Sandpaper.—Baeder & Adamson.....dis 20 %
M. B. & D.....dis 25&5 %
Sash Weights.—Patent Eye.....₱ lb 1½c
Saws.—Hand Saws, Disston's.....dis 20 %
Wheeler & Clemson.....dis 30 %
Cross-Cut Saws.
W. M. & C., Common Tooth, No. 1.....₱ foot 35c
" " Champion " .....₱ foot 35c
Disston's, Common " .....₱ foot 44c
" Gt. American " .....₱ foot 44c
Boynton's Lightning " .....₱ foot 45c
M. B. & D., Hand Saws.....dis 40 %
W. M. & Co.'s, Circular Saws.....dis 40 %
Saw Setts.—Spring Lever.....₱ doz $10.00
Saw Blades.—Disston.....dis 20 %
W. M. & C.....dis 10 %
Welch & Grimth, Extra.....₱ doz $8.40
" " No. 2.....₱ doz 7.00
Scales.—Fairbanks.....dis 25 %
Howe.....dis 25 %
Screws.—Aiken's Flat-Head Iron.....dis 60 %
American Flat-Head Iron.....dis 60 %
" " Brass.....dis 45 %
" Round-Head " .....dis 30 %
" " Iron .....dis 45 %
Grilley " Nickel-plated Piano..dis 55&5 %
" " Common.dis 50 %
Shaves.—Kimball's.....₱ inch 75c
Watrous.....dis 15 %
Shears.—American Shear Co.....dis 75 %
Shot.—Tatham's.....₱ lb 6½c
Shovels.—O. Ames.....dis 20 %
O. Ames, other brands.....dis 20 %
M. B. & D.....dis 20 %
Oxford, Birmingham Pattern.....dis 45 %
Snow Shovels.—Malleable tips.....₱ doz $5.00
Skates.—Union.....dis 25 %
Acme.....dis 20 %
Spoons.—Tinned Iron.....dis 40 %
Britannia.....dis 50 %
Rogers' A No. 1.....dis 40&5 %
Stock and Dies.—King's.....dis 10&5 %
Tacks.—A. Field & Son's.....dis 50&25 %
Pittsfield.....dis 50&25 %
Traps.—Oneida, Genuine.....dis 33⅓ %
Oneida, Imitation, H. & N.....dis 50&10 %
Blake's.....dis 50&10 %
Tree Scrapers.—No. 1.....₱ doz. $2.00
No. 2.....₱ doz 3.00
No. 3.....₱ doz 4.00
Vises.—Simpson's Adjustable.....dis 20&10 %
Howard Vise Co.....dis 33⅓ %
P. L. & Co., Solid Blacksmiths' new list.....dis 10
Weather Strips.
Browne's Flexible Rubber.....dis 30 %
In 20 feet boxes; No. 1, ½ in. wide, ₱ yard, 10c.; No. 2, ⅝ in., 15c.; No. 3, ¾ in., 20c.; No. 4, 1 in., 25c.
Valentine's Felt Moulding.....dis 30 %
Black Walnut Spring Weather Strips.....₱ doz. $4.00
Window Springs......dis 20 %
Babcock's No. 3.....₱ gross 3.25
" " 4 " .....₱ gross 4.15
Wire Goods.—Gate Hooks and Eyes, &c., new list.....dis 40 &10 %
Wrenches.—A. G. Coe's.....dis 60&10&10 %
Girard Mfg. Co.....dis 60&10&10&5 %
Girard Agt.....dis 70&10&5 %
Wringers.—Universal, No. 2.....₱ doz $6.00
Universal, No. 2½.....₱ doz 6.00
Novelty, No. 10.....₱ doz 60.00
" No. 2.....₱ doz 63.00
" No. 22.....₱ doz 67.50
Excelsior, No. A.....₱ doz 78.00
" No. B.....₱ doz 90.00
" No. CC.....₱ doz 108.00
Novelty Set Tub, E.....₱ doz 6.00
Eureka.....₱ doz 51.00
Keystone, Wood Frame No. 1½.....₱ doz 51.00
" Iron Frame No. 2½.....₱ doz 51.00
Peerless.....₱ doz. No. 2½, 60.00; No. 2, 63.00; No. 3, 71.00
Unique, No. 1.....₱ doz 54.00
Zinc......₱ lb 7½c
Withington, Cooley & Co.—Hoes, Rakes, Forks, &c. dis 40&10 %. Special rate for Export.

St. Louis Metal Market.

(Corrected Weekly by Messrs. R. Sellers & Co.)

Tin Plate.

IC, 10x14, Best Char..	$7.25	DX, 12½x11, B. Char.	$ 9.25
IX, 10x14, " ..	9.25	DXX, 14x17 " ..	11 2 5
IC, 12x12, " ..	7.25	DXXX, 12½x17 " ..	13.25
IX, 12x12, " ..	9.25	DXXXX, 14½x17, " ..	15.25
IC, 14x20, " ..	7.25	IC, 20x28, " ..	17.00
IX, 14x20, " ..	9.25	IX, 20x28, " ..	21.00
IXX, 14x20, " ..	11.25	IXX, 20x24, " ..	25.00
IXXX, 14x20, B. Char.	13.25	IXXX, 20x28 " ..	30.00
IXXXX, 14x20, " ..	15.25	IC, 14x20, Best Roof..	6.75
IC, 12x24, " ..	7.50	IX, 14x20, " ..	8.75
IX, 12x 4, " ..	9.50	IC, 20x28, " ..	13.75
IC, 14x14 " ..	13.25	IX, 20x28, " ..	17.75
IX, 14x14, " ..	15.25	IC, 10x14, Best Coke..	9.25
IXX, 14x14, " ..	14.25	IC, 14x20, " ..	6 7
DC, 12½x17, " ..	7.25	IC, 10x20, " ..	9 7

Per box 225 sh's Sale Tin 6 7 5

Sheet Iron.	Com'n.	SL U D. Sm'th.	Ref'n'd Iron.	Russia Iron.
No. 14 to 16	3 4 c	4 20c	6 20c.	7 30c
No. 18 to 20	3 50b	4.20c	6.20c	7.30c
No. 22 to 24	3 60c	4 30c	6 30	7 30.
No. 26	3 60c	4 40c	6 50c	7 70c
No. 27	3 70c	4 50c	6 70	7 90c

Genuine Russia Iron.

Perfect—No. 9, 10, 11, 12..... per lb. 13 c
No. 1 Stained—No. 9, 10, 11, 12..... per lb. 13
Tare 22 lbs. to Bdle. For less than Bdle. add ½c. ₱ lb

Patent Planished Iron

No. 24 to 27, A quantity..... per lb. 10½c
" B " ..... " 11½c
For less than Bdle. add ½c. per lb.

Galvanized Sheet Iron.

Juniata, or 1st quality, Discount for full bundles .. 35 %

Block Tin.

Banca, Large Pigs	22c	do. Small	19c
Straits, Large Pigs	18c	Bar	20c
Eng. Ref'd, Large Pig	18c		

Solder.

R. S. & Co.'s Extra Half and Half	₱ lb 13 c	cases, no charge for packing	12½c
R. S. & Co.'s Extra Half and Half, in 100 ℔		No. 1, in Bars	10½c
		Spelter Solder	24 c
Pig Lead—Pigs	5.5	In Bars	6c
Antimony			14c
Bismuth			4 1 50
Nickel			1.15
Crucibles.—Dixon's			₱ No. 4 c

Babbit Metal.

No. 1	₱ lb. 16c	No. 3	₱ lb 9 c
" 2	12c	" 4 "	8 c

Copper.

Brazier's, 30x60, 14 to 160 lbs. Sheets 14c
" " 10, 11 & 12 lbs., " 24c
" " 8 and 9 lbs. " 30c
" " 6 and 7 lbs. " 36c
Tinned, 14x48, 14 and 16 oz.....35c
Planished, 14x48, 14 and 16 oz.....38c
" 1 foot Sizes, 14 and 16 oz.....32c
Gutter Copper, 20 and 24x72, 10, 11 and 12 ℔ Sheets.....40c
" 14 lb. Sheets.....42c
Reservoir Copper, 16x60 and 18x60.....25c
Bar Copper, Square and Round, ⅜ to 1½ inch.....24c
" " ⅝ inch.....26c
Copper Bottoms.....28c
Metallic Bottoms.....1 c
Soldering Coppers.....26c

Brass.

Roll, No. 14 to 28, 12 in. in width.....25c
" 30, 12 in. in width.....16c
" 32, 16 " 32c
" 34, 16 " 35c
" 38, 16 " 37c
Platers, No. 40, 6 " 35c
Discount per c. nt.

Brass and Copper Wire.

Brass.	Copper.		Brass.	Copper
No. 0 to 20....28c	34c	No. 24....32c		40c
" 21....31c	41c	" 25....38c		4 c
" 22....32c	44c	" 26....44c		74c
" 23....33c	48c	" 27....48c		53c

Brass Spring Wire, 2c. ₱ ℔ advance.
Discount 10 per cent.

Brass Tubing

Plain ⅛ to 3 inch.....38c | 5-16 inch.....38c
⅜ inch.....38c | ½ " 66c

Copper Rivets and Burs.....dis 20 %
Brass Kettles 8 to 15 inches.....dis 20 %
" " all sizes over 15 inches.....₱ lb 45c

Sheet Zinc.—600 lbs. cask.....8½c
250 lbs. cask, 8c; 100 lb. cask.....8½c
Sheet.....8½c

Wire.—Iron, Bright Market.....dis 60 %
Iron, Coppered Market.....dis 40 %
Fence, Nos. 7, 8 and 9.....₱ lb 3.4 c
Trellis, Nos. 10 and 11.....4½c
" No. 12.....4½c
Hay Baling, Charcoal, No. 10 and 11.....5 c
" " No. 12.....5½c
Broom, Tinned, Nos. 13 to 22.....9c
Fence Staples.....per keg 4.25
Per lb.....4½c
Iron Rivets.—Black, papered.....dis ⅝
Tinned, papered.....dis ⅝
In bulk.....new 5-16 ⅜ 7-16 ½ In diam.
8 4c 7 8c 7.3c 6 8.3 per lb

Tacks.—New Hardware List.....dis 50 %
Sad Irons.....₱ lb 3½c
Enameled Kettles.—Standard Mfg Co.....dis 55 %
Enameled Sauce Pans. Standard Mfg. Co. dis 50 %
Enameled Boilers.—Standard Mfg. Co ...dis 40 %
Dripping Pans.—Smooth Iron.....₱ lb 8 c
Grocers' Pliers.....per doz $12.00
Shepard " .....dis 50 %
Monroe Fluters.....12.00
Stove Polish.—Dixon's.....₱ gross 5.50
Gem.....4.00
Standard.....3.75
Coffee Mills.—Parker's.....dis 25 %
Granite Iron Ware.....dis 50 %

Machinery, &c.

THE JUDSON GOVERNOR.

It is a common method to advertise Governors *without cost*, unless satisfactory to the customer, and then charge *High Prices* for doing what any good Governor will do. Various Governors inferior to the "Judson" are sold in this way, operating well enough for three months, to insure collection of the pay, but becoming useless after a year's wear—their construction lacking durability. The Judson Governor is guaranteed to be not only the best Regulator of Steam Engines, but also the most durable Governor made. Parties in buying other Governors should stipulate that their durability be guaranteed, and should also take care that they do not, for much inferior Governors, pay higher prices than those shown in the accompanying list. We guarantee the Judson Governor will do all any other Governor can do, and in accuracy and durability—the main essentials—we guarantee it shall do more.

Reduced Price List,

OCTOBER 15, 1878.

☞ For dimensions of Governor, see Illustrated Price List.

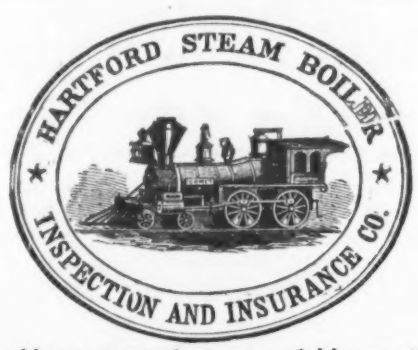
THE JUDSON PATENT

Improved Steam Governor.

Size, Inch.	Plain.	Bright Finished.	Extra for Spe'd'r	Stop Valve.
½	$15.00	$17.00	$1.90	....
¾	16.00	18.00	1.90	....
1	18.00	20.00	2.00	....
1¼	20.00	23.00	2.25	....
1½	23.00	27.00	2.50	$6.00
2	27.00	31.00	2.75	7.50
2¼	32.00	37.00	3.25	9.00
2½	36.00	41.00	3.50	11.00
2¾	40.00	46.00	3.75	12.00
3	45.00	52.00	4.25	14.00
3½	54.00	62.00	4.50	17.00
4	64.00	73.00	5.00	21.00
4½	74.00	84.00	5.50	25.00
5	84.00	95.00	6.00	31.00
5½	97.00	109.00	6.50	37.00
6	112.00	125.00	7.00	42.00
7	132.00	146.00	8.00	50.00
8	160.00	176.00	9.00	60.00
9	180.00	198.00	10.00	75.00
10	200.00	220.00	12.00	....

No Charge for Boxing or Cartage.

JUNIUS JUDSON & SON, Rochester, N. Y.



Issues Policies of Insurance after a careful inspection of the Boilers

COVERING ALL LOSS OR DAMAGE TO

Boilers, Buildings and Machinery,

ARISING FROM

STEAM BOILER EXPLOSIONS.

The Business of the Company includes all kinds of STEAM BOILERS.

Full information concerning the plan of the Company's operations can be obtained at the

COMPANY'S OFFICE, HARTFORD, CONN.,

or at any Agency.

J. M. ALLEN, Pres. W. B. FRANKLIN, Vice-Pres. J. B. PIERCE, Sec.

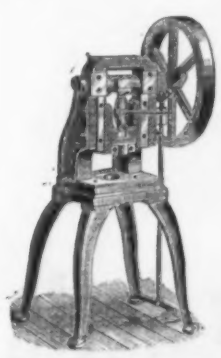
Board of Directors:

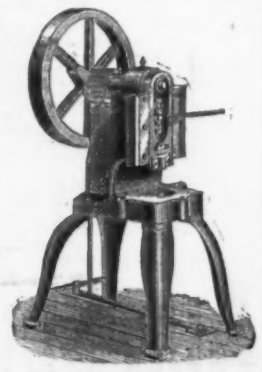
J. M. ALLEN, President.
LUCIUS J. HENDEE, Pres't Ætna Fire Ins. Co.
FRANK W. CHENEY, Ass't Treas. Cheney Brothers Silk Manufacturing Co.
CHARLES M. BEACH, of Beach & Co.
DANIEL PHILLIPS, of Adams Express Co.
GEO. M. BARTHOLOMEW, Pres't Amer. Nat'l Bank.
RICHARD W. H. JARVIS, Pres't Colt's Fire Arms Manufacturing Co.
THOMAS O. ENDERS, Sec'y Ætna Life Ins. Co.
LEVERETT BRAINARD, of Case, Lockwood & Brainard.
GEN. WM. B. FRANKLIN, Vice Pres't Colt's Pat. Fire Arms Mfg. Co.
GEO. CROMPTON, Crompton Loom Works, Worcester
WILLIAM ADAMSON, of Baeder, Adamson & Co., Philadelphia.
HON. THOS. TALBOT, Ex-Governor of Mass.
NEWTON CASE, Case, Lockwood & Brainard, Hartford
WILLIAM S. SLATER, Cotton Manufacturer, Providence, R. I.
NELSON HOLLISTER, of State Bank, Hartford.
D. R. SMITH, Pres't Springfield Fire & Marine Ins. Co

A. H. MERRIMAN,

Patent Power

PUNCHING PRESSES.



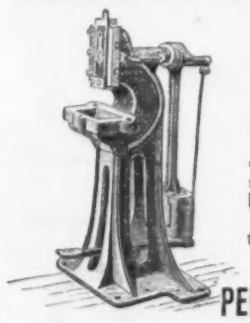


WEST MERIDEN,

CONNECTICUT.

ASTONISHING POWER

in FOOT and HAND PRESSES.



Punching, by foot, *3-4* hole in *5-16* iron 6 inches from edge.

Smaller sizes punch, by foot, *3-8* x *1-4*, and *1* inch by *1-8*, as rapidly as by power presses, at one-half the cost.

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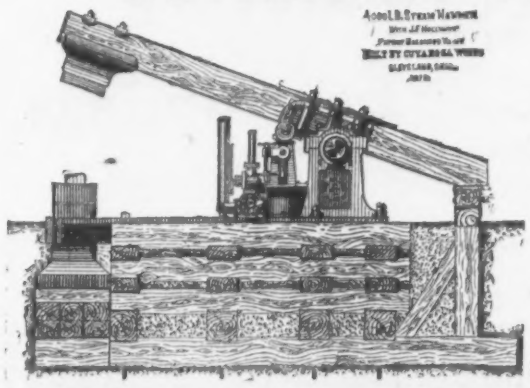

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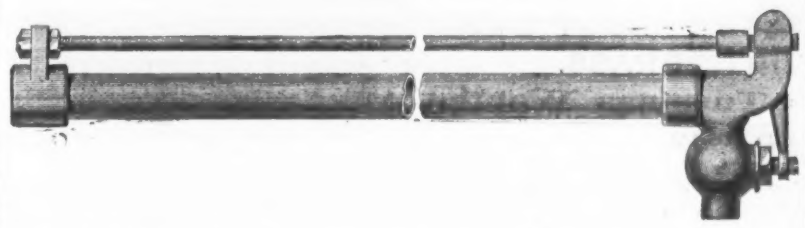

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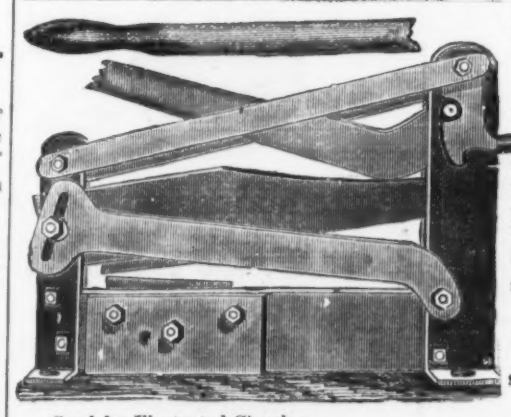

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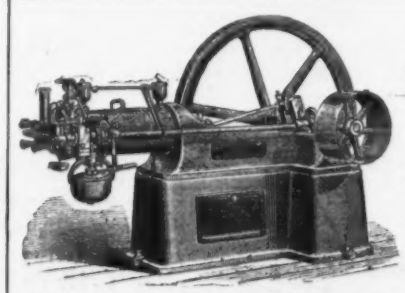

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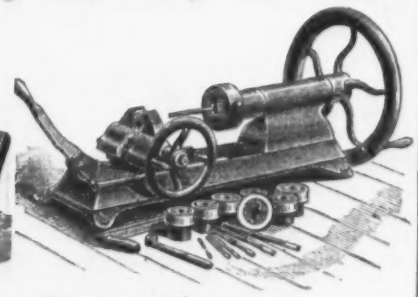

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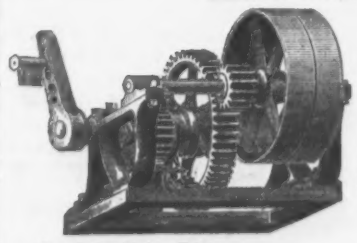

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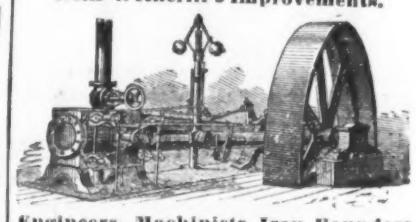

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